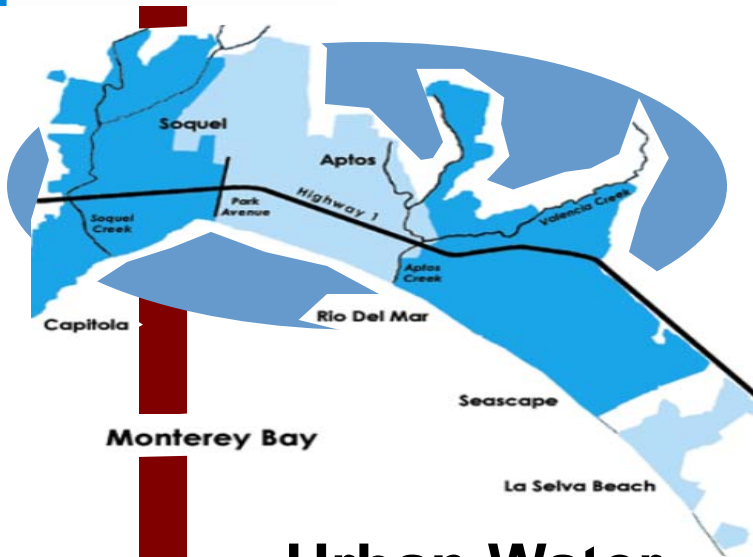




SOQUEL CREEK  
WATER DISTRICT



# Urban Water Management Plan 2010



**PROTECTING OUR RESOURCES TO ENSURE ADEQUATE SUPPLY IS AVAILABLE TO MEET  
EXISTING AND FUTURE DEMANDS**



# Urban Water Management Plan 2010

Santa Cruz County, California  
Adopted by the Board of Directors on September 20, 2011

Soquel Creek Water District  
Santa Cruz County, California

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## Acronyms and Abbreviations

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AB	–	Assembly Bill
AB 32	–	The Global Warming Solutions Act of 2006 California Assembly Bill 32
AB 797	–	The California Urban Water Management Planning Act Assembly Bill 797; (Section 10610-10656, et seq. of the California Water Code, Division 6, Part 2.6)
AB 3030	–	Groundwater Management Act Assembly Bill 3030 (Section 10750, et seq. of the California Water Code)
af	–	acre-feet
afy	–	acre-feet per year
AL	–	action level
AJC Park	–	Anna Jean Cummings Park
AJH	–	Aptos Junior High
AMBAG	–	Association of Monterey Bay Area Governments
AP	–	action plan
AWWA	–	American Water Works Association
Aromas	–	Aromas Red Sands Aquifer
Basin	–	Soquel-Aptos Groundwater Basin
BMO	–	Basin Management Objective
BMP	–	Best Management Practice
CCR	–	California Code of Regulations
CDPH	–	California Department of Public Health
CEQA	–	California Environmental Quality Act
CHSC	–	California Health and Safety Code
CIMIS	–	California Irrigation Management Information System
City	–	City of Santa Cruz
cfs	–	cubic feet per second
CII	–	commercial, industrial, and institutional
Co.	–	County
CUWCC	–	California Urban Water Conservation Council
CWD	–	Central Water District
District	–	Soquel Creek Water District
DMM	–	Demand Management Measures
DoF	–	California Department of Finance
DWR	–	California Department of Water Resources
EIR	–	Environmental Impact Report
EnergyStar	–	A joint program of the U.S. Environmental Protection Agency and the U.S. Department of Energy to encourage energy efficiency by labeling consumer products that meet efficiency specifications
ERC	–	Emergency Response Coordinator
ERP	–	Emergency Response Plan
eto	–	evapotranspiration (accounts for evaporation and transpiration)
F	–	Fahrenheit
FTE	–	full-time equivalent

## Acronyms and Abbreviations – continued

gpcd	–	gallons per capita per day
gpm	–	gallons per minute
GIS	–	geographical information system
GHG	–	green house gas
green	–	green vehicles have reduced emission levels and more efficient use of gasoline or use an alternative to petroleum based gasoline.
HCP	–	Habitat Conservation Plan (for the City of Santa Cruz)
HET	–	high-efficiency toilet (uses 1.28 gallons per flush or less)
HOA	–	Home Owners Associations
IRP	–	Integrated Resources Plan
IRWMP	–	Integrated Regional Water Management Plan
LED	–	light-emitting diode
MCL	–	Maximum Contaminant Level
mgd	–	million gallons per day
mg/L	–	milligrams per liter
MOU	–	Memorandum of Understanding
N/A	–	not applicable
NOAA	–	National Oceanic and Atmospheric Administration
NWS	–	National Weather Service
OEHHA	–	Office of Environmental Health Hazard Assessment
OCR	–	Operating Contingency Reserve
ppb	–	parts per billion
ppm	–	parts per million
PGR Park	–	Polo Grounds Regional Park
PAC	–	Public Advisory Committee
PHG	–	Public Health Goal
PRMS	–	Precipitation-Runoff Modeling System
PRSV's	–	pre-rinse spray valves
Purisima	–	Purisima Formation
PVWMA	–	Pajaro Valley Water Management Agency
Qua	–	uppermost unit of the Aromas Red Sands Aquifer
Qla	–	lowermost unit of the Aromas Red Sands Aquifer
SB	–	Senate Bill
SB x7-7	–	The Water Conservation Act of 2009; Senate Bill x7-7
SCADA	–	Supervisory Control and Data Acquisition
SCCEH	–	Santa Cruz County Environmental Health Services Agency
SCWD	–	City of Santa Cruz Water Department
scwd <sup>2</sup>	–	cooperative desalination program between SqCWD and the City of Santa Cruz
SDWA	–	Safe Drinking Water Act
SEMS	–	Standardized Emergency Management System
SGC	–	Seascape Golf Course
SRP	–	satellite reclamation plant
SqCWD	–	Soquel Creek Water District
TAZ	–	traffic analysis zone

## Acronyms and Abbreviations – continued

UHET	–	ultra high-efficiency toilet (uses 1 gallon per flush or less)
ULFT	–	ultra-low flush toilet (uses 1.6 gallons per flush or less)
US Census	–	United States Census
US EPA	–	United States Environmental Protection Agency
USGS	–	United States Geological Survey
UWMP	–	Urban Water Management Plan
UWMP Act	–	The California Urban Water Management Planning Act (California Water Code, Division 6, Part 2.6)
WaterSense	–	U.S. Environmental Protection Agency program to encourage water efficiency by labeling consumer products that meet water efficiency and performance specifications
WARN	–	Water/Wastewater Agency Response Network
WDO	–	Water Demand Offset
WET	–	Water Education for Teachers
WMP	–	Well Master Plan
WSCP	–	Water Shortage Contingency Plan
WUERM	–	Water Utility Emergency Response Manager

### Additional Notes:

Acre-foot/year – this refers to the amount of water that covers one acre one foot deep in water, which equates to 325,851 gallons.

Overdraft – the condition of a groundwater basin in which the amount of water withdrawn exceeds the amount of water that recharges the basin over a period of years.

Sustainable yield – the amount of groundwater that can be removed from an aquifer on a long-term /sustained basis without negative impacts to the groundwater quality or creating an undesirable effect.

## Introduction

The California Urban Water Management Planning Act (UWMP Act)(California Water Code, Division 6, Part 2.6) requires the development and adoption of an **Urban Water Management Plan** (UWMP) every five years from water suppliers that:

- Provide more than 3,000 acre-feet of water annually;  
or
- Have 3,000 or more service connections.

The UWMP Act became part of the California Water Code in 1983 with the passage of Assembly Bill 797. The UWMP Act has been amended and expanded since its inception to address new water related issues as they develop. The main purpose of the UWMP Act is to require water suppliers to achieve proper water supply planning to ensure adequate water supplies are available to meet existing and future demands. Suppliers are required to assess current demands and supplies over a 20-year planning horizon and consider various drought scenarios. The UWMP Act also requires suppliers to conduct water shortage contingency planning and develop drought response actions, and to report on water demand management measures that the supplier has implemented to increase water conservation.

As the Soquel Creek Water District (SqCWD) provides more than 3,000 acre-feet of water annually, and has more than 3,000 service connections, we have produced an UWMP every five years since the first Plan was required in 1985. The last UWMP SqCWD produced was in 2005, and under routine circumstances, the 2010 UWMP would have been due in December of 2010. However, because of the recent changes in UWMP requirements, State law extended the deadline for 2010 Plans to July 1, 2011. The next UWMP submittal will be the 2015 Plan, due December 31, 2015.

This 2010 UWMP includes important information on SqCWD's water supply sources, water deliveries and uses, projected water demand, drought contingency and emergency response measures, and current and planned conservation programs. The UWMP is one of several documents that SqCWD uses as a long-range water supply planning tool.

Recent legislative changes resulting from the passage of Senate Bill x7-7 (SB x7-7) (hereafter referred to as the Water Conservation Bill of 2009) require urban water suppliers to report the following data in their 2010 UWMP:

- **Base daily per capita water use** – the urban water supplier's average gross water use, reported in gallons per capita per day and calculated over a continuous 10-year period (ending no earlier than December 31, 2004, and no later than December 31, 2010) and a continuous five-year period (ending no earlier than December 31, 2007, and no later than December 31, 2010). *Gross water use is defined as the total volume of water, whether*

*treated or untreated, entering the supplier's distribution system.* In addition to water used for residential purposes within the SqCWD, this includes water used within the commercial and institutional sectors, water used for landscaping and fire protection, and water attributed to system loss. It is important to note that water suppliers have traditionally based per capita water calculations on residential consumption alone, thus resulting in lower per capita values than reported in this UWMP.

- **Urban water use target** – the supplier's targeted gross water use on a per capita basis in 2020, taking into account water conservation practices that currently are and plan to be implemented.
- **Interim urban water use target** – the supplier's targeted gross water use on a per capita basis in 2015, a value halfway between the baseline daily per capita water use and the urban water use target.
- **Compliance daily per capita water use** – the gross water use within the supplier's distribution system on a per capita basis, to be calculated in 2015 and 2020 to determine the supplier's progress towards meeting the interim urban water use and urban water use targets, respectively.

This information will be used to enable water agencies, as well as the State of California, to set targets and track progress toward decreasing daily per capita urban water use throughout the state by 20 percent by the year 2020.

This UWMP satisfies the requirements of the UWMP Act and the Water Conservation Bill of 2009, and consists of the following sections in the format recommended by the California Department of Water Resources:

**Section 1: Plan Preparation** - This section includes information on how the UWMP was prepared, coordinated with other agencies and the public, and adopted.

It includes the following subsections:

- Coordination
- Plan Adoption, Submittal, and Implementation

**Section 2: System Description** - This section provides background on the SqCWD's organizational structure, service area, water supply, and resource management. It also includes descriptions of the water supply system (i.e., production, transmission, treatment and distribution facilities) to support the Water Conservation Act of 2009 requirements, discussions of changes to the water system since the 2005 UWMP, and discussions of factors that currently affect the water system supply.

Lastly, this section describes the climate, population and demographics within the SqCWD service area. It includes population projections for the service area through the year 2030 based on 2010 United States Census data and regional projections provided by the Association of Monterey Bay Area Governments. This section also includes a discussion of difficulties encountered in developing population estimates and projections for service areas that do not overlap with jurisdictional boundaries, and discusses the methodologies used to develop current and past population estimates and future population projections.

This section includes the following subsections:

- Service Area Physical Description
- Service Area Population

**Section 3: System Demands** - This section describes the SqCWD's past (2005), current (2010) and projected (in 5-year increments starting with 2015 up through year 2030) water use by sector or customer category (e.g., single-family residential, multifamily residential, commercial, institutional, etc.). The water use projections for years 2015-2030 include estimated water use for lower income single-family and multifamily housing units within the SqCWD service area, as required by Section 10631.1(a) of the California Water Code.

This section also includes SqCWD baseline (base daily per capita) gross water use for the 10-year period of 2001-2010 and the 5-year period of 2003-2007, as well as the 2015 interim and 2020 urban gross water use targets. The methodology and assumptions used to determine the baselines and targets for the service area are discussed in detail in this section.

This section includes the following subsections:

- Baselines and Targets
- Water Demands
- Water Demand Projections
- Water Use Reduction Plan

**Section 4: System Supplies** - This section provides background information on groundwater within the Soquel-Aptos area and the two groundwater aquifers, the Purisima Formation and the Aromas Red Sands Aquifer, that provide supply for SqCWD. These two aquifers currently provide 100 percent of the supply for the SqCWD service area. This section also includes a discussion of source reliability, and current and possible future limitations associated with the existing groundwater source.

SqCWD efforts to manage groundwater supplies within the Soquel-Aptos area are also discussed. In general, these efforts include conducting additional studies to further define groundwater conditions, projecting future demand requirements, and identifying possible strategies to recover the groundwater basin, prevent further

seawater intrusion, and maintain long-term pumping within protective levels. Specific efforts include the Groundwater Management Plan that was adopted in 2007 by the SqCWD and Central Water District to establish pumping goals for the Soquel-Aptos area, and the SqCWD Well Master Plan that was approved on February 22, 2011 to redistribute pumping away from coastal and depressed groundwater areas and to replace aging infrastructure.

In addition to SqCWD's existing source of water, this section also evaluates potential future sources of supply, including water exchanges or transfers, the development of desalinated water, and the development of recycled water for non-potable uses. The SqCWD has been evaluating these and other potential water sources for more than 20 years, and this section describes the findings and conclusions from numerous studies.

The final element of this section is to discuss water supply projects and programs (other than the demand management measures identified in Section 6) that SqCWD may undertake to meet the projected total water demand through 2030. This analysis includes demand projections for each 5-year increment from 2015-2030 considering three possible water year classification scenarios:

1. An average supply year;
2. A single-dry year; and
3. A multiple-dry year period (i.e., three or more consecutive) dry years.

The following subsections are included in this section:

- Water Sources
- Groundwater
- Transfer Opportunities
- Desalinated Water Opportunities
- Recycled Water Opportunities
- Future Water Projects

**Section 5: Water Supply Reliability and Water Shortage Contingency Planning** - This section compares projected water supplies and demand, assesses the overall reliability of future supplies regardless of drought or emergency conditions, discusses how the SqCWD's water supply sources can vary as a result of emergency or system limitations, and describes SqCWD's Water Shortage Contingency Plan.

This section includes the following subsections:

- Water Supply Reliability
- Water Quality
- Water Shortage Contingency Plan for short-term supply shortages, long-term supply shortages, and shortages due to groundwater overdraft.

**Section 6: Demand Management Measures** - This section includes a description and evaluation of specified water demand management measures (DMMs) (e.g., water survey programs, residential plumbing retrofits, system water audits). All of the specified DMMs are currently being implemented by the SqCWD with the exception of DMM J, which is not applicable. The evaluation of DMMs includes a description of the methods used to evaluate the effectiveness of each measure, an estimate of existing conservation savings on water use within the SqCWD service area, and the effect of the savings on the SqCWD's ability to further reduce demand.

This section also includes a description of additional water demand management measures that SqCWD implements beyond those required to be addressed in the UWMP and prescribed by California Urban Water Conservation Council (CUWCC). Although these additional measures are not required to be discussed in the UWMP, they are included to provide a more complete picture of SqCWD's conservation efforts.

**Section 7: Climate Change** - This section includes a discussion of potential water supply and demand effects related to climate change.

**Section 8: Completed UWMP Checklist** - This section includes a completed UWMP Checklist which confirms that this document includes all of the applicable required elements, and shows the page number where each element can be found within the Plan.

As shown in the Table of Contents, this Plan includes a List of Acronyms and Abbreviations, as well as a List of References. The Appendix contains documents related to the preparation of this Plan and is included at the end of the Plan.

Since public participation is an important component of this document, SqCWD welcomes constructive input.

## Section 1: Plan Preparation

This section includes specific information on how the Soquel Creek Water District (SqCWD) 2010 Urban Water Management Plan (UWMP) was prepared, coordinated with other agencies and the public, and adopted. It includes the following subsections:

- Coordination
- Plan Adoption, Submittal, and Implementation

### ***Required Elements - Coordination***

*Checklist Item #4. Each urban water supplier shall coordinate the preparation of its plan with other appropriate agencies in the area, including other water suppliers that share a common source, water management agencies, and relevant public agencies, to the extent practicable (10620(d)(2)).*

SqCWD staff coordinated the development of this plan with the following local agencies:

- The City of Capitola
- The County of Santa Cruz Planning Department, Health Services Agency Water Resources Division, and Sanitation District
- The City of Santa Cruz Water Department
- The City of Santa Cruz Wastewater Treatment Facility
- The City of Watsonville Public Utilities Department
- The City of Scotts Valley
- Central Water District
- The Pajaro Valley Water Management Agency
- The Association of Monterey Bay Area Governments

**Table 1-1** summarizes the efforts SqCWD has taken to include appropriate agencies in its planning process. **Appendix A** includes copies of general documentation supporting this outreach process with other agencies.

Table 1-1 Agency Coordination						
Coordinating Agencies	Sent notice of intention to adopt plan at least 60 days prior to hearing	Participated in developing the plan	Contacted for assistance	Sent a copy of the draft plan or notified of availability	Commented on the draft plan	Attended public meetings
<b>Water Suppliers:</b>						
City of Santa Cruz	✓	✓	✓	✓		
City of Watsonville	✓			✓		
Central Water District	✓			✓		
Pajaro Valley Water Management Authority	✓			✓		
Scotts Valley Water District	✓			✓		
<b>Public Agencies:</b>						
Association of Monterey Bay Area Governments	✓	✓	✓	✓		
City of Capitola	✓	✓	✓	✓		
City of Santa Cruz Planning Department	✓			✓		
Co. of Santa Cruz Board of Supervisors, First & Second Districts	✓			✓		
Co. of Santa Cruz Health Services Agency, Water Resources Division	✓	✓	✓	✓	✓	✓
Co. of Santa Cruz Planning Department	✓	✓	✓	✓		
Co. of Santa Cruz Sanitation District		✓	✓	✓		

*Checklist Item #6. Every urban water supplier required to prepare a plan pursuant to this part shall, at least 60 days prior to the public hearing on the Plan required by Section 10642, notify any city or county within which the supplier provides water supplies that the urban water supplier will be reviewing the plan and considering amendments or changes to the plan. The urban water supplier may consult with, and obtain comments from, any city or county that receives notice pursuant to this subdivision (10621(b)).*

**Table 1-1** indicates the agencies notified in writing of preparation of the 2010 UWMP at least 60 days prior to the public hearing to consider adoption of the SqCWD 2010 UWMP. **Appendix B** contains a list of all the agencies and elected officials that were provided with a copy of this letter, as well as a copy of the standard letter.

*Checklist Item #54. The urban water supplier shall provide that portion of its urban water management plan prepared pursuant to this article to any city or county within which it provides water supplies no later than 60 days after the submission of its urban water management plan (10635(b)).*

Section 10635(b) of the California Water Code (Division 6, Part 2.6, Chapter 3, Article 2.5) pertains to water service reliability. This subject is addressed in detail in Section 5 of the 2010 UWMP. As Section 5 is a component of the UWMP, and SqCWD is required to provide the 2010 UWMP to the City of Capitola and the County of Santa Cruz within 30 days of adoption, SqCWD will easily meet this requirement. Please note that the City of Capitola is the only city within the SqCWD service area, and the entire SqCWD service area is located within the County of Santa Cruz.

*Checklist Item #55. Each urban water supplier shall encourage the active involvement of diverse social, cultural, and economic elements of the population within the service area prior to and during the preparation of the plan (10642).*

The SqCWD has actively encouraged community participation in its urban water management planning efforts prior to and during preparation of the 2010 UWMP. Since the last UWMP submittal in 2005, the SqCWD has used the following methods to obtain input from, inform, and educate the community within our service area:

- Community Events – SqCWD staff conducted outreach at numerous community events over the last five years, including but not limited to the following: Farmers' Markets, Earth Day Festivals, the Capitola Chamber of Commerce Business Showcase, the City of Capitola Watershed Festival, Cabrillo College's Plant Sale, the Santa Cruz County Fair, and the Smart Gardening Faire. The primary focus of outreach at these events was to promote conservation, but efforts were also made to inform the community about SqCWD water supply issues and supplemental supply planning, to obtain input from the community, and to respond to questions.

- Community Informational Meetings – In conjunction with the City of Santa Cruz, SqCWD held six community forums at different venues over the last two years to inform and educate the public of the following local water issues: groundwater overdraft and seawater intrusion, SqCWD conservation programs, SqCWD history of water planning, supplemental water supply options evaluated over the last 20 years, use of recycled water as a supplemental supply, and marine impacts related to desalination. Materials and information from these forums, in addition to the video footage of the meetings, can be viewed on the **scwd<sup>2</sup>** Regional Seawater Desalination Program website at [www.scwd2desal.org](http://www.scwd2desal.org).
- Individual and Small Groups Meetings – SqCWD staff conducted approximately 120 meetings with individuals and organizations within the community over the past 5 years. The purpose of these meetings was to directly outreach to the stakeholders about conservation, water supply planning, and water education programs.
- Presentations – SqCWD staff provided numerous presentations and tours (estimated 150) to various public and special interest groups.
- Newsletters – SqCWD publishes a newsletter six times a year that is oriented toward informing and educating customers about conservation and water supply issues. The newsletter is enclosed with the customer's water bill and is posted on the SqCWD's web site. The March/April 2011 newsletter contained an article notifying customers that the 2010 UWMP was being prepared and would be available in the coming months for public review.
- Water Bill Notices – A notice was printed directly on SqCWD customer water bills for the April/May 2011 billing cycle, informing customers that the 2010 UWMP was being prepared and to contact SqCWD for more information.
- Website – In March 2011, SqCWD posted an article on the [www.soquelcreekwater.org](http://www.soquelcreekwater.org) website to inform the community that the Draft 2010 UWMP was being prepared, and to solicit public input. In May 2011, a second article was posted on the website regarding the status of the Draft 2010 UWMP and the tentative date for the public hearing to receive comments on the UWMP and to consider adoption. The Draft 2010 UWMP (excluding Sections 5 and 8) was posted on the website on July 15, 2010. The complete Draft 2010 UWMP was posted on the website on September 1, 2011. Additionally, the **scwd<sup>2</sup>** Desalination Program website ([www.scwd2desal.org](http://www.scwd2desal.org)) has information on water supply issues and integrated water planning.
- Email Updates – In conjunction with the City of Santa Cruz, SqCWD issues a monthly email update to individuals interesting in keeping up-to-date on the integrated water planning and the evaluation of desalination. Since January 2009, 36 email updates have been sent out. The February 2011 email update included an article about the Urban Water Management Plan Update and the July 2011 email update included a tentative schedule for the public hearing.
- Newspaper Column – SqCWD staff has written a bi-monthly column for the community newspaper (Santa Cruz Sentinel) since November 2008 that focuses on local water issues and water conservation. In February 2011, staff published an article on the 2010 UWMP. The article discussed the purpose and key

components of the UWMP, and requested public participation in the development of the Plan.

- Advertisements – SqCWD routinely runs print advertisements in the local newspapers related to rebate programs and water conservation.
- Telephone Survey – In fall of 2010, the SqCWD in conjunction with the City of Santa Cruz, hired a consultant to conduct a statistically valid telephone survey to determine the level and areas of customer knowledge about SqCWD's water supply and quality issues and supplemental supply alternatives. The survey will be used as a tool to more effectively direct SqCWD outreach efforts.
- Television Shows – SqCWD staff have participated in three one hour-long shows on Community Television of Santa Cruz County (fall 2009, winter 2007, and spring 2005) concerning conservation and the local water supply issues. Each show was aired several times. Copies of the shows also are available for loan from SqCWD.

Materials from some of the outreach efforts mentioned above are included in **Appendix C**.

*Checklist Item #56. Prior to adopting a plan, the urban water supplier shall make the plan available for public inspection and shall hold a public hearing thereon. Prior to the hearing, notice of the time and place of hearing shall be published within the jurisdiction of the publicly owned water supplier pursuant to Section 6066 of the Government Code. The urban water supplier shall provide notice of the time and place of hearing to any city or county within which the supplier provides water supplies.*

SqCWD published a complete draft of the 2010 UWMP on September 1, 2011 for public review. A public hearing to consider adoption of the SqCWD 2010 UWMP was scheduled for September 20, 2011, to coincide with a regularly-scheduled Board of Directors Meeting. Prior to the public hearing, the SqCWD published a legal notification on two separate occasions. The legal notice was first published in the Santa Cruz Sentinel on September 1, 2011, and was re-published on September 11, 2011. The legal notice informed the public of the availability of the Draft UWMP, and provided details regarding the date, time and place of the public hearing. The notification was made pursuant to Section 6066 of the Government Code. **Appendix D** contains a copy of the legal notice for each published date and any display advertisements published.

Additionally, on September 1, 2011, the City of Capitola, the County of Santa Cruz Planning Department, and the County of Santa Cruz Health Services Agency Water Resources Division were provided with a copy of the Draft UWMP, and were notified of the scheduled date, time and place of the public hearing. A copy of the letter to each of these agencies is included in **Appendix E**. Other coordinating agencies (as shown in Table 1-1) were notified of the on-line availability of the Draft UWMP and the scheduled date, time and place of the public hearing. A copy of the standard letter sent to these agencies is also included in Appendix E.

A special outreach effort was also made on September 12, 2011, to notify a broad spectrum of potentially interested parties of the availability of the 2010 Draft UWMP and the scheduled public hearing. This information was included in the monthly email update published via the **scwd**<sup>2</sup> Desalination Program. The email recipients include individuals, special interest groups, businesses and business organizations, media outlets, special districts, local government officials, regional agencies and State and Federal agencies. A copy of the **scwd**<sup>2</sup> monthly email update sent to these recipients is included in **Appendix F**.

On September 1, 2011, the Draft UWMP was made available for review at the SqCWD's office, and on the SqCWD's website at [www.soquelcreekwater.org](http://www.soquelcreekwater.org).

**Appendix G** includes copies of public comments received on the Draft 2010 UWMP and SqCWD responses to comments.

***Required Elements – Plan Adoption, Submittal and Implementation***

*Checklist Item #7. The amendments to, or changes in, the plan shall be adopted and filed in the manner set forth in Article 3 (commencing with Section 10640)(10621(c)).*

If the SqCWD proposes changes or amendments to the 2010 UWMP after it is adopted, then the revisions shall be publicly presented to and adopted by the District's Board of Directors and filed in the manner set forth in the California Water Code, Article 3.

*Checklist Item #57. After the hearing, the plan shall be adopted as prepared or as modified after the hearing (10642).*

The SqCWD's Board of Directors adopted the 2010 UWMP on September 20, 2011. **Appendix H** contains a copy of Resolution No. 11-26 showing the adoption of the UWMP by the District's Board.

*Checklist Item #58. An urban water supplier shall implement its plan adopted pursuant to this chapter in accordance with the schedule set forth in its plan (10643).*

The SqCWD shall implement its 2010 UWMP as presented in the document. For example, the process for declaring a drought emergency and curtailment actions as outlined in the UWMP will be used to implement such actions. SqCWD Staff shall also review the plan periodically, and any necessary changes or amendments will be adopted pursuant to Article 3 of the California Water Code.

*Checklist Item #59. An urban water supplier shall submit to the department, the California State Library, and any city or county within which the supplier provides water supplies, a copy of its plan no later than 30 days after adoption. Copies of amendments or changes to the plans shall be submitted to the department, the California State Library, and any city or county within which the supplier provides water supplies within 30 days after adoption (10644(a)).*

## Section 2: System Description

This section describes the organizational structure of the Soquel Creek Water District (SqCWD) and the area serviced in regards to customer types, climate, population, and demographics. This section also includes a detailed description of the SqCWD's water supply source and programs currently in place to manage this resource. Lastly, this section also provides descriptions of components of the physical system (i.e., production, transmission, storage, treatment, and distribution facilities) to support the Water Conservation Act of 2009 requirements, and a discussion of factors that affect the SqCWD water system in regards to quality and supply.

Included are the following subsections:

- Service Area Physical Description
- Service Area Population

### ***Required Elements — Service Area Physical Description***

*Checklist Item #8. Describe the service area of the supplier (10631(a)).*

#### **Background/Organizational Structure**

The SqCWD is a nonprofit, local government agency that provides potable water service and groundwater resource management within its service area. Founded in 1961 under the County Water District Law (Water Code, Division 12, Section 30000 et. seq.), the SqCWD's original purpose was to provide flood control and water conservation services. In 1964, the SqCWD acquired the Monterey Bay Water Company and discontinued flood control services.

A five-person Board of Directors, elected to four-year terms by the registered voters throughout the SqCWD's service area, governs the SqCWD. The Directors are responsible for policy decisions that govern the operations of the SqCWD. The General Manager is responsible for the day-to-day operations of the SqCWD, as well as long-range planning. As of June 30, 2011, SqCWD staff consists of 38.125 full-time equivalent (FTE) positions and .337 FTE temporary employees assigned to five departments: Administration, Conservation and Customer Service Field, Engineering, Operations and Maintenance, and Financial/Business Services.

The SqCWD's operating income is derived from water rates, service charges, connection charges and water capacity fees. All customer connections to the SqCWD distribution system are metered and customers are currently billed on a bi-monthly basis. Bills include a flat rate service charge (based on meter size), and a variable tiered water-quantity rate based on consumption. The flat rate service charge covers costs that SqCWD incurs regardless of whether any water is sold, including the costs related to SqCWD's 24-hour emergency response, meter readings, billings, collections, and customer service inquiries. Connection and water capacity charges are a one-time fee due prior to installation of new or expanded water services. Connection charges cover the cost of physically connecting to the SqCWD system and include the cost of meters, meter boxes and pipelines, as well as the materials

and labor necessary to perform the connection. Water capacity fees pay for maintaining the infrastructure of SqCWD 's facilities in existence at the time the charge is imposed, and pay for new facilities to be constructed in the future that are of benefit to the person or property being charged. From these sources, all of the SqCWD's operating expenses are covered, including capital improvements, gas and electric costs, water quality costs, wages and benefits for staff, supplies and services, insurance premiums, bond debt, and prudent reserves for emergencies and unexpected shortfalls in revenue.

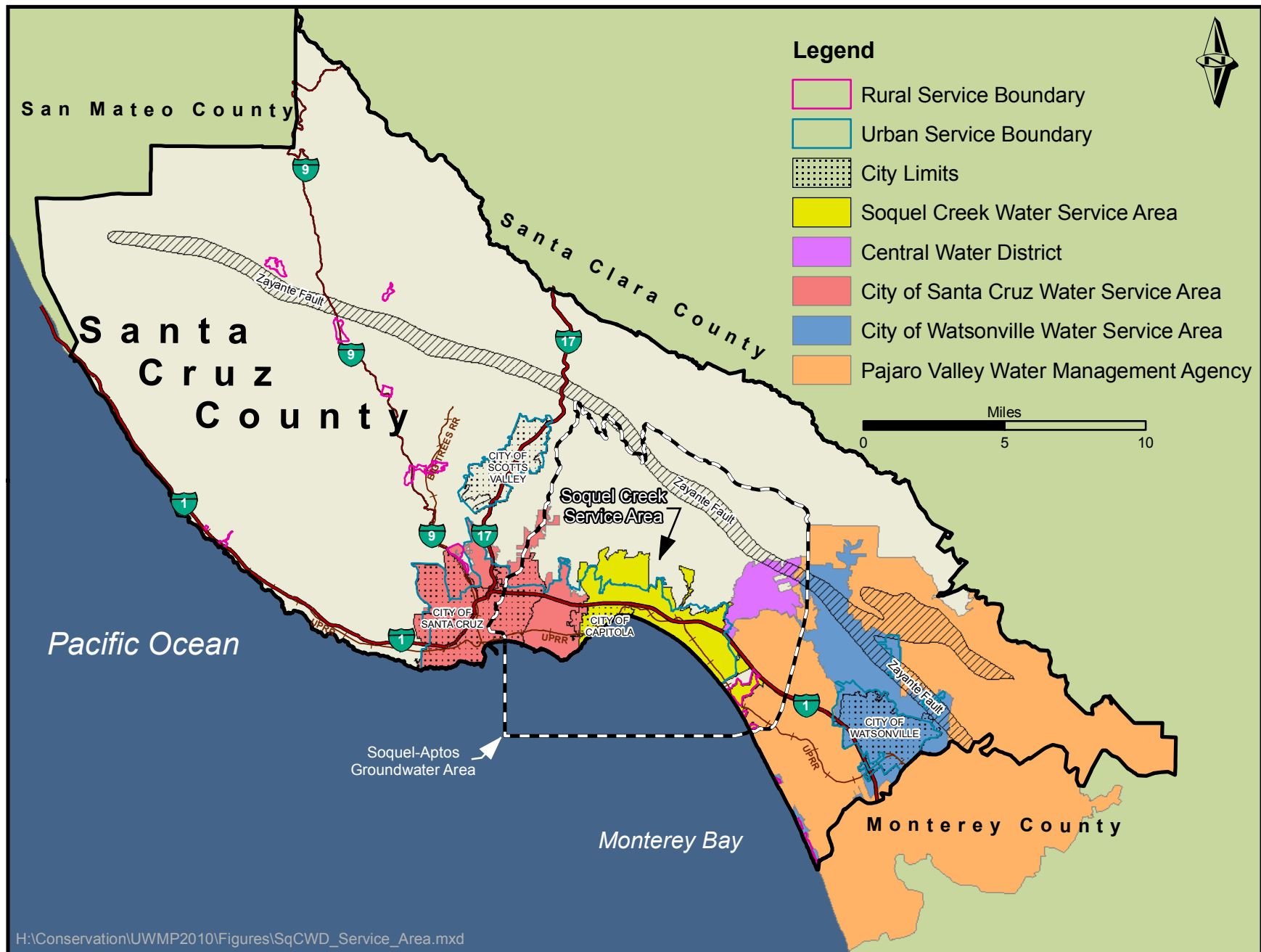
SqCWD does not receive any State or Federal tax revenues. In recent years, SqCWD has been awarded several State and Federal grants, and plans to actively pursue additional grant assistance in the future.

### **Service Area and Water Supply**

Today, the SqCWD serves a population of about 37,720 (Association of Monterey Bay Area Governments (AMBAG), March 28, 2011) through approximately 15,420 service connections (including approximately 1,320 fire service connections and approximately 180 dedicated landscape irrigation connections) in four service subareas within mid-Santa Cruz County (see **Figure 2-1**). The SqCWD encompasses seven miles of shoreline along Monterey Bay, and extends from one to three miles inland into the foothills of the Santa Cruz Mountains, essentially following the County Urban Services Line. The City of Capitola is the only incorporated area within the SqCWD. Unincorporated communities include Aptos, La Selva Beach, Rio Del Mar, Seascapes, Seacliff Beach, and Soquel.

There are currently seven customer categories within the SqCWD: Single-family residential, Multifamily residential, Commercial, Fire, Institutional and Governmental, Irrigation, and SqCWD. Excluding fire service connections, approximately 93 percent of the SqCWD connections (as of December 31, 2010) are single-family and multifamily residential. The remaining 7 percent are primarily comprised of commercial connections (approximately 5 percent), followed by dedicated landscape connections (approximately 1 percent). Institutional connections, and connections used by SqCWD for facility operations and maintenance, each comprise less than 1 percent of the total number of connections. There are currently no agricultural or industrial connections to the SqCWD distribution system.

The SqCWD currently receives 100 percent of its water from groundwater aquifers in the Soquel-Aptos area. The aquifers are located within two geologic formations that underlie the SqCWD service area. The Purisima Formation (Purisima) provides approximately two-thirds of SqCWD's annual production and serves the communities of Capitola, Soquel, Seacliff Beach, and Aptos. The Aromas Red Sands (Aromas) aquifer provides the remaining one-third of SqCWD's annual production and mainly serves the communities of Seascapes, Rio Del Mar, and La Selva Beach.



SOURCE: Soquel Creek Water District, 2011

**Figure 2-1**  
Soquel Creek Water District Service Area

The current average annual demand in the SqCWD service area, based on average annual demand from 2006 through 2010, is 4,615 acre-feet per year (afy) (approximately 1.5 billion gallons). As a result of ongoing conservation efforts and other potential factors including but not limited to weather, the economic downturn, and rate increases, the average annual demand has been reduced by approximately 800 acre-feet when compared to average annual demand from 2001 to 2005, which was 5,416 afy (approximately 1.77 billion gallons).

The groundwater within the Soquel-Aptos area is also a source of supply for the City of Santa Cruz Water Department, Central Water District (CWD), and numerous mutual water companies and private wells. Water production data are generally only available from the public water agencies; however, there has been some effort to extrapolate total production based on land use. It is estimated that SqCWD pumps approximately 60 percent of the total annual groundwater yield from the Soquel-Aptos area, with the remaining 40 percent pumped by all other users (Johnson et al., 2004).

Coastal groundwater levels are below elevations that protect the Soquel-Aptos area from seawater intrusion, therefore creating a state of overdraft (HydroMetrics LLC, 2009a). This potential for seawater intrusion indicates that collective pumping by the SqCWD, the City of Santa Cruz, CWD, and other public and private users has exceeded the sustainable groundwater yield of the Soquel-Aptos area over the long term. Hydrogeologic studies conducted in 2004 estimated that the sustainable yield for SqCWD was not more than 4,800 acre-feet/year (afy) with 3,000 afy available from the Purisima, and 1,800 afy available from the Aromas (Johnson et al., 2004) and these values were set as SqCWD's pumping goals in the Soquel-Aptos Groundwater Management Plan (HydroMetrics LLC, 2007). However, a study of outflow needed to achieve protective groundwater levels (HydroMetrics LLC, 2009b) concluded that the previous estimate of 4,800 afy was likely hundreds of acre-feet per year too high to protect against seawater intrusion after groundwater levels recover to protective elevations. Recent modeling and evaluations by HydroMetrics WRI (2011) indicate that SqCWD's portion of the sustainable yield of the Purisima is approximately 2,500 afy, and SqCWD's portion of the sustainable yield of the Aromas could be just a few hundred acre-feet, which is significantly less than the 1,800 afy previously projected. In order to recover groundwater levels to protective elevations and eliminate overdraft, SqCWD must temporarily reduce pumping to levels below its portion of the sustainable yield (HydroMetrics WRI, 2011) and other pumpers must not further impact the overdrafted portion of the basin.

In response to continuing overdraft conditions, SqCWD is advocating conservation and pursuing a supplemental supply. SqCWD also completed a Well Master Plan and will be developing up to five new wells over the next five or so years to redistribute pumping inland. Additionally, groundwater modeling and evaluations are still underway to more fully characterize protective elevations and the sustainable yield within portions of the Aromas aquifer used by SqCWD.

### **Description of Physical System**

SqCWD's water supply system currently consists of 18 groundwater production wells, 15 of which are currently active, approximately 130 miles of pipeline, and 18 water storage tanks. The production well locations are shown in **Figure 2-2**. The District's water production, storage, treatment and distribution system is operated within four individual water service areas that are herein referred to as Service Areas 1, 2, 3 and 4 (see **Figure 2-2**). These service areas, which originated as privately owned water systems, were consolidated to form the SqCWD. Service Areas 1 and 2 are intertied by the McGregor Drive Transmission Line; Service Areas 3 and 4 are intertied by the San Andreas Road Transmission Line. Although interconnections between Service Areas 1 and 2 and between Service Areas 3 and 4 allow for some movement of water between service areas, the transfer of water between Service Areas 1 and 2 and Service Area 3 is not currently possible.

The total estimated production capacity of the system is about 7 million gallons per day, and the total storage capacity is 7.5 million gallons. Some of the District's wells are 20 to nearly 80 years old, have lost production capacity, and have grown increasingly vulnerable to mechanical failure.

The SqCWD has three interties with the City of Santa Cruz and two interties with CWD for emergency purposes.

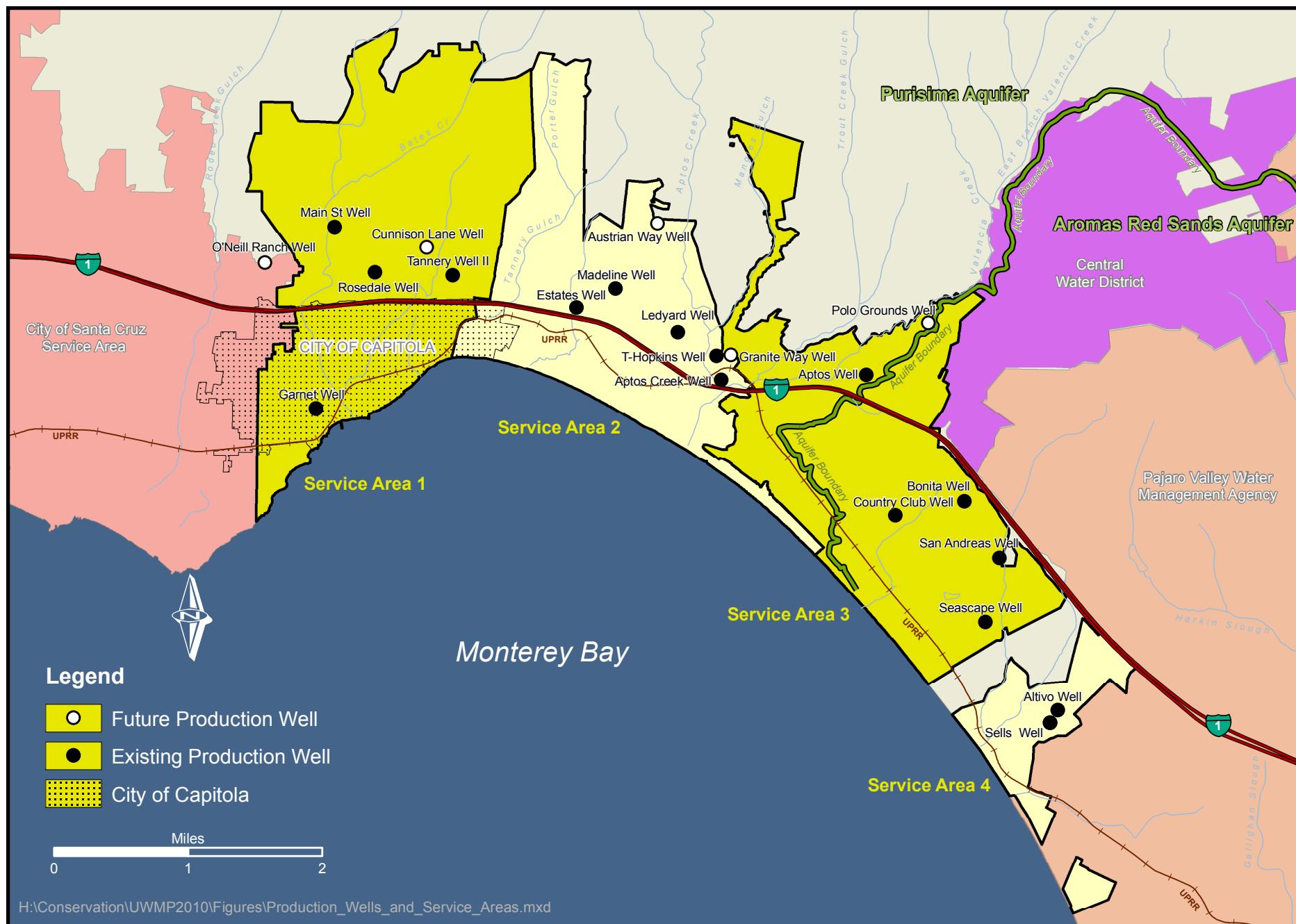
### **Resource Management**

In addition to supplying water to customers, the SqCWD actively manages groundwater resources in the Soquel-Aptos area both individually and through a joint powers agreement with CWD for regional groundwater management under the authority granted by California Water Code §10753 et. seq.

Beginning in the early 1980's, SqCWD installed a series of coastal monitoring wells and instituted a program of monthly data collection and hydrogeological analysis in order to have an early warning of conditions conducive to seawater intrusion, which is the biggest threat to the District's water supply.

By at least the mid-1990's, groundwater levels began declining and were not recovering to above sea level as necessary to maintain a barrier against seawater intrusion. In response to this change in groundwater conditions, SqCWD developed a draft Integrated Resources Plan (IRP) to define the water supply shortage and actions for addressing it, including diversifying the water supply portfolio. The draft IRP was developed over 18 months by a 25-member public advisory committee comprised of various stakeholder groups including residents, businesses, environmentalists and private well owners.

The SqCWD simultaneously implemented an aggressive conservation program with the goal to minimize demand and avoid further exacerbating groundwater conditions as the result of growth. SqCWD has continually enhanced its conservation efforts



SOURCE: Soquel Creek Water District, 2011

**Figure 2-2**  
**Production Well Locations and Service Areas 1 thru 4**

with cost-effective ways to improve and expand the program. Components of SqCWD's conservation program are discussed in detail in Section 6.

In 2003, a Water Demand Offset (WDO) policy was adopted to avoid a moratorium on development in the District and to extend existing groundwater sources until a supplemental water supply can be developed. This policy requires applicants for new water service to offset 1.2 times the amount of water the new development is projected to use so that there is a "zero impact" on the District's water supply. The WDO policy is discussed in more detail in Section 6.

After conducting feasibility studies of the various supplemental supply alternatives identified in the draft IRP, the SqCWD adopted a final IRP in early 2006. This document identifies the following components for assuring a sustainable water supply:

- Demand Management
  - Continued implementation of existing and new conservation and drought management programs
- Conjunctive Use Supply Project
  - Evaluation and potential development of a regional seawater desalination facility with the City of Santa Cruz
- Local Supplemental Supply Alternatives
  - If determined to be needed, preparation of project-level feasibility studies for a modified Soquel Creek diversion project and/or local-only desalination as alternatives, or in addition to, the regional desalination project
  - Development of site specific recycled water supplies for non-potable irrigation use
- Groundwater Management
  - Continued monitoring/assessment of coastal groundwater quality and levels under the guidelines provided in the Groundwater Management Plan for the Soquel-Aptos Area (SqCWD and CWD, 2007), first adopted in 1996
  - Redistribute groundwater pumping to alleviate the potential for seawater intrusion as identified in the Well Master Plan
  - Support recharge protection and enhancement projects and policies

The IRP is to be implemented in phases to meet the growing shortages that could occur in the future, to respond to changes in water supply conditions as individual

components are carried out, and to facilitate periodic updates to the IRP. Since its adoption, SqCWD has sustained a focused effort to implement the IRP. To date, the following elements have been accomplished:

□ Demand Management

- SqCWD has maintained and expanded conservation efforts including adopting water use efficiency requirements for new/remodeled development and rebate incentives for newly available technology, e.g. high efficiency toilets, graywater systems, weather-based irrigation controllers, etc.

□ Local Supplemental Supply Alternative

- Completed a grant funded feasibility study for satellite reclamation plants to provide non-potable water for large irrigation use.

□ Regional Desalination Project Evaluation

- SqCWD has entered into a memorandum of agreement with the City of Santa Cruz to evaluate developing a 2.5 million gallon per day capacity shared seawater desalination facility. The City of Santa Cruz currently relies almost exclusively on surface water sources and needs a supplemental supply only during drought conditions (approximately one in every six years). SqCWD would have priority use of the desalination facility during non-drought conditions to help supplement water demand needs while reducing groundwater pumping (approximately five out of six years). This partnership allows the agencies to share the costs associated with evaluating, studying, and potentially building the project. To date, a one-year pilot study and feasibility studies for intake, brine disposal and pre-treatment have been completed to inform the Environmental Impact Report (EIR), which is underway. An Energy Minimization and Greenhouse Gas Reduction Study is also being conducted. There has and will continue to be extensive public outreach on this project, which has a dedicated web site: [www.scwd2desal.org](http://www.scwd2desal.org).
- A tentative operating agreement has also been prepared regarding items such as production scheduling, cost allocations, emergency requests for water, and arbitration procedures for handling disputes. The tentative agreement establishes a capital cost allocation of 41 percent SqCWD, 59 percent City of Santa Cruz on the basis of proportional annual maximum utilization of the desalination facility.

□ Groundwater Management

- In 2007, there was a comprehensive update of the 1996 Groundwater Management Plan for the Soquel-Aptos Area (Hydrometrics LLC). This Plan

established groundwater management goals to: 1) ensure water supply reliability for current and future beneficial uses; 2) maintain water quality to meet current and future beneficial uses; and 3) prevent adverse environmental impacts. Basin management objectives (BMO) were established to meet each goal and specific actions were identified to achieve each BMO. Actions include: regular groundwater level and quality monitoring from production wells and dedicated monitoring wells, particularly a series of monitoring wells along the coast; developing a supplemental water supply; managing pumping through redistribution inland and away from critical coastal areas; water conservation and re-use; interagency coordination; and public education.

- Other recent SqCWD efforts to manage the basin's groundwater include the Well Master Plan (WMP) (ESA 2011), which was approved in 2011 and provides for: (1) the development of up to four new groundwater production wells at four locations in the Purisima Formation; (2) the conversion of an existing irrigation well in the Purisima to a municipal production well; (3) the abandonment and destruction of one deteriorated production well; and (4) the removal of two wells from production and the maintenance of those wells as inactive wells. New water treatment facilities for iron and manganese removal are proposed adjacent to four of the wells, and one well would utilize an existing treatment facility. The future well sites specified in the WMP are shown in **Figure 2-2**.

Under the WMP, the SqCWD would re-distribute pumping both vertically and horizontally to achieve more uniform drawdown of groundwater in the Soquel-Aptos area, reduce susceptibility to seawater intrusion, and minimize localized pumping depressions. Consistent with its groundwater management goals, the WMP states that SqCWD would take actions to limit the pumping from all active wells to no more than 4,800 afy, on average, subject to the constraints of meeting water demand within each of SqCWD's four service areas and the limited capacity to transfer water between service areas.

Based on recent evaluations of the state of the groundwater basin and predictions on recovery and sustainability (HydroMetrics WRI, 2011), all of the cumulative benefits from the actions described above will not alleviate the need to develop a supplemental supply sufficient to:

- 1) Restore protective groundwater levels by limiting groundwater pumping.
- 2) Maintain protective groundwater levels for the long-term.

The proposed regional seawater desalination project with the City of Santa Cruz continues to be the preferred alternative for a supplemental supply and is undergoing continued evaluation through the preparation of an EIR, which is planned for completion in 2012.

These resource management efforts and the evaluation of seawater desalination as a supplemental supply are discussed in greater detail in Section 4.

### **Factors Affecting Water Supply**

The groundwater supply within the Soquel-Aptos area is influenced by a number of factors, including natural geochemical properties and flow within the different hydrogeologic formations, groundwater pumping and the potential for induced seawater intrusion, land use practices, and accidental releases of contaminants into the environment (ESA, 2011). Historically, groundwater quality issues for drinking water resources within the SqCWD have included impacts from potential seawater intrusion in the Aromas and the Purisima, naturally occurring elevated metals (i.e., iron, manganese and arsenic in the Purisima Formation, and hexavalent chromium (chromium-6) in the Aromas Red Sands), and anthropogenic contamination (e.g. nitrates).

During the 2005-2010 reporting period for this Urban Water Management Plan (UWMP), groundwater from SqCWD wells was within State and Federal primary Maximum Contaminant Levels (MCLs). The constituents with primary MCLs that have been detected in the past, and are closely monitored, include naturally occurring elevated metals (i.e., arsenic in the Purisima and chromium (total) in the Aromas from erosion of natural deposits) and nitrates due to runoff and leaching from fertilizer use and septic tanks.

In the Purisima, groundwater from three of 15 wells is currently treated to remove arsenic even though detected levels do not exceed the primary MCL for this constituent. Additionally, two naturally occurring constituents (i.e., iron and manganese) have historically exceeded secondary MCLs in eight of 15 Purisima wells. Groundwater from these wells is treated to reduce concentrations of iron and manganese to levels below their respective secondary MCLs. Other naturally occurring constituents, most notably hexavalent chromium or chromium-6, are closely monitored even though they are currently unregulated.

Of the groundwater quality factors mentioned above, those with the greatest potential to impact the SqCWD water system are seawater intrusion in the Aromas and the Purisima, and naturally occurring chromium-6 in the Aromas.

Ongoing seawater intrusion in the Aromas aquifer poses a threat to several SqCWD wells, and a significant potential exists for eventual intrusion near SqCWD wells located in the Purisima Formation (Johnson et al., 2004). To monitor and protect against seawater intrusion, SqCWD collects data from a series of coastal monitoring wells on a routine basis to identify water quality changes, and as previously discussed, has implemented numerous groundwater management measures and an IRP to first restore the groundwater basin to levels that are protective against seawater intrusion and then to limit groundwater pumping to within sustainable levels.

Naturally occurring chromium-6 may also impact future water supply availability within the Aromas as a result of potential regulatory changes. Chromium-6 is a known human carcinogen for chronic inhalation exposure and a probable human carcinogen for chronic oral exposure. It is currently regulated under the primary drinking water standard or Maximum Contaminant Level (MCL) of 50 parts per billion (ppb) for the State and 100 ppb for the Federal government, for total chromium. In 1999, the State began to evaluate whether a specific MCL was appropriate for chromium-6, based on concerns about potential carcinogenicity when ingested. These concerns resulted in a State law that required the development of an MCL for chromium-6 by 2004. A California State MCL has yet to be developed, although as part of the required process for developing an MCL, the State Office of Environmental Health Hazard Assessment (OEHHA) proposed a draft chromium-6 Public Health Goal (PHG) of 0.06 ppb in 2009. PHGs are non-enforceable goals based solely on public-health considerations, and do not take practical risk-management factors (e.g., treatment technology availability, benefits, and costs) into consideration. Drinking water with contaminant levels exceeding a PHG can still be considered acceptable for public consumption.

In December of 2010, OEHHA proposed a new draft PHG for chromium-6 of 0.02 ppb, lowered from the 0.06 ppb PHG proposed in 2009. The draft chromium-6 PHG of 0.02 ppb was adopted by the State in July of 2011. The California Department of Public Health (CDPH) will use the adopted PHG to develop a chromium-6-specific State MCL. A Federal drinking water standard for chromium-6 is also being developed by the U.S. Environmental Protection Agency (US EPA). Depending upon the standards adopted by the CDPH and US EPA, future challenges for the SqCWD may include treatment technology availability, benefits and cost, all of which may have an impact on SqCWD's supply.

SqCWD began testing for chromium-6 in the Aromas aquifer in January 2001 in response to direction from CDPH. Since 2001, chromium-6 has been detected in six of the active water supply wells all located within SqCWD service areas 3 and 4. Within these six wells, SqCWD has voluntarily completed repetitive tests which measured both chromium-6 and total chromium at concentrations ranging from 0.42 ppb to 40 ppb. These levels are within the current State and Federal MCL's of 50 ppb and 100 ppb, respectively, for total chromium. However, these chromium-6 levels are still substantially higher than the State's adopted PHG of 0.02 ppb. As the California Health and Safety Code requires the CDPH to establish an MCL at a level as close as is technically and economically feasible to a contaminant's PHG, it is likely that SqCWD will have to conduct some level of chromium-6 treatment in the Aromas to continue using this source of water.

*Checklist Item #9. (Describe the service area) climate (10631(a)).*

**Climate**

The SqCWD is located 30 miles north of Monterey and 80 miles southeast of San Francisco. Since the area is located on the sunny side of Monterey Bay, it enjoys a mild climate with an average January temperature of 50 degrees and an average July temperature of 63 degrees. Summers are mild and dry, and winters are cool, with an annual average of approximately 31 inches of precipitation. It is a sheltered area protected from winter fogs and summer heat by the Santa Cruz Mountains. **Table 2-1** displays average climatic data for the SqCWD service area.

<b>Table 2-1 – Climate Data</b>						
	<b>Jan</b>	<b>Feb</b>	<b>March</b>	<b>April</b>	<b>May</b>	<b>June</b>
<b>Standard Monthly Average Evapotranspiration (Eto) (inches)<sup>a</sup></b>	1.36	1.93	3.26	4.70	4.87	5.32
<b>Average Total Precipitation (inches)<sup>b</sup></b>	6.18	5.47	4.30	1.92	0.81	0.22
<b>Average Temperature (Fahrenheit)<sup>b</sup></b>	49.6	51.7	53.3	55.6	58.3	61.4
	<b>July</b>	<b>Aug</b>	<b>Sept</b>	<b>Oct</b>	<b>Nov</b>	<b>Dec</b>
<b>Standard Monthly Average Evapotranspiration (Eto) (inches)<sup>a</sup></b>	5.03	4.84	3.60	2.96	1.64	1.30
<b>Average Total Precipitation (inches)<sup>b</sup></b>	0.06	0.07	0.43	1.37	3.31	5.20
<b>Average Temperature (Fahrenheit)<sup>b</sup></b>	62.9	63.3	63.0	59.8	54.5	50.1

Footnotes:

<sup>a</sup> Standard monthly average evapotranspiration (Eto) data are from the California Irrigation Management Information System (CIMIS) web site at [www.cimis.water.ca.gov/cimis/welcome.jsp](http://www.cimis.water.ca.gov/cimis/welcome.jsp). Data from the Santa Cruz, CA station No. 104 over the time period September 1990 through December 2010.

<sup>b</sup> Average total precipitation and average temperature data are from the Western Regional Climatic Center administrated by NOAA at web site <http://www.wrcc.dri.edu/cgi-bin/cliMAIN.pl?ca7916>. Data from the Santa Cruz, CA station No. 047916 recorded from January 1, 1893 to July 31, 2010.

**Required Elements — Service Area Population**

*Checklist Item #10. (Describe the service area) current and projected population . . . The projected population estimates shall be based upon data from the state, regional, or local service agency population projections within the service area of the urban water supplier . . . (10631(a)).*

### **Current Population**

Over the years, the service area has changed from a rural agricultural and weekend or summer-resort water use area to a permanent, year-round, urbanized water use area. Santa Cruz County is also an important vacation and recreation area, having a spectacular coastline, accessible beaches, and forested mountains, all in proximity to several Northern California metropolitan areas.

The population within the area directly served by SqCWD's distribution system has increased from approximately 15,920 in 1964 (SqCWD, 2005) to approximately 37,720 in 2010. The estimated population for 2010 is based on the Association of Monterey Bay Area Governments' (AMBAG) analysis of 2010 United States Census (US Census) data for the SqCWD service area (AMBAG, 2011). This estimate and a summary of the methodology used by AMBAG are included as **Appendix I**. The 2010 estimated population of 37,720 is about 13,000 persons less than the projected 2010 population provided in SqCWD's 2005 UWMP. The large variation between the 2005 UWMP projected population for 2010, and the 2010 UWMP estimated population for 2010, may be due to a combination of the following factors:

- 1) The SqCWD service area does not neatly correspond to jurisdictional boundaries or the boundaries of cities, where population data is readily compiled by the State Department of Finance on an annual basis. Instead, the SqCWD service area includes a portion of one city (i.e., Capitola) and a portion of a large unincorporated area (i.e., Santa Cruz County). In order to obtain past population estimates for portions of unincorporated areas, it is necessary to match or overlay the US Census boundaries with the service area boundaries as closely as possible. However, Census boundaries (i.e., Tracts, Block Groups and Blocks) do not neatly align with SqCWD's service area in all cases, thus requiring an extrapolation. This extrapolation is based on a ratio of parcels within a Census boundary and within the SqCWD, to the total number of parcels within the Census boundary. This ratio is then applied to the estimated population within the Census boundary to estimate the population within the service area. While this may be the most accurate method for obtaining population data for the SqCWD service area, the number of assumptions that are required potentially lower the accuracy of the estimate.
- 2) The AMBAG Census-based population estimates included in this 2010 UWMP for Census years 2000 (38,403 persons) and 2010 (37,720 persons) were done at the Block Level, which is the smallest available boundary size used by the Census. Block Groups are the next largest size, followed by Tracts. Using the smallest available boundary size reduces the amount of extrapolation required, and thus increases the accuracy. It appears that Tracts were used in the 2005 UWMP, thus rendering different (i.e., higher) results. In fact, AMBAG calculated an estimated 2010 SqCWD service area population of 38,876 persons using Block Groups, whereas the estimated

service area population using Blocks was less by a total of 1,156 persons. For the purposes of this 2010 Plan, SqCWD has chosen the population estimates that are based on Blocks as they likely provide the greatest degree of accuracy.

- 3) The AMBAG population projections included in the 2005 UWMP did not account for decreases associated with the economic downturn that became apparent several years later. According to Anais Schenk of AMBAG, even the most recent projections included in the Monterey Bay Area 2008 Regional Forecast (AMBAG) did not fully account for the severity and extended duration of the economic downturn and thus, may have over-projected population numbers within the region as a whole. In the 2008 Regional Forecast, AMBAG reported a projected population of 135,173 for Unincorporated Santa Cruz County, whereas the 2010 Census reported a population of 129,739, a difference of 5,434 persons.

Additionally, there is a 9 percent variation in the AMBAG 2010 population estimate for the SqCWD service area (which is based on their 2008 Regional Forecast), and the AMBAG 2010 population estimate for the service area (which is based on 2010 US Census data). AMBAG estimated a 2010 service area population of 41,514 using their 2008 Regional Forecast, and a service area population of 37,720 using the 2010 US Census data. This variation may be due to the following factors:

- 1) As previously mentioned, the AMBAG 2008 Regional Forecast did not fully account for the severity of the economic recession. The predicted rate of growth between 2005 and 2010 did not materialize, and an AMBAG comparison of 2000 and 2010 US Census data indicate the service area population declined by 683 persons between 2000 and 2010.
- 2) According to Randy Deshazo, Principal Planner for AMBAG, “AMBAG’s forecasts have been designed to anticipate and be consistent with the California Department of Finance’s (DoF) annual population estimates because they are used in a variety of State programs and are widely considered to be more accurate than the US Census. Routinely, local governments have indicated that the Census undercounts low income and migrant populations in urban areas and in rural areas. As DoF figures attempt a more complete accounting of the population through driver’s license data and other secondary sources, DoF estimates are typically higher than the Census reports for the same year” (AMBAG, 2011).

For instance, the DoF estimated that the City of Capitola had a population of 10,198 people on January 1, 2010, whereas the Census estimated a population of 9,918 on April 1, 2010. The DoF reported a 2010 population of 137,873 for unincorporated Santa Cruz County, whereas the Census reported a 2010 population of 129,739. In areas served by SqCWD, the 2010

population projections made by AMBAG in their 2008 Regional Forecast fall between those of the US Census on the low end, and the DoF on the high end.

Although recognized as probably being more accurate, the DoF is required to adjust its estimates to the 2010 Census population count.

- 3) While low income and migrant populations are not prevalent in the SqCWD service area, there are a number of vacation rentals and second homes in the coastal neighborhoods within the service area. As the Census only counts occupants at their primary residence, the occupants of these vacation rentals and second homes are not included in SqCWD service area population counts. However, these places of residence may be occupied throughout the year, and especially during periods of peak water use.

### **Projected Population**

The SqCWD service area population estimates for years 2000 and 2010, and the forecasted population estimates for the five-year increments beginning in 2015 and ending in 2035, are included in **Table 2-2**.

<b>Table 2-2</b> <b>Past<sup>a</sup> and Projected<sup>b</sup> Population Estimates</b>							
	<b>2000</b>	<b>2010</b>	<b>2015</b>	<b>2020</b>	<b>2025</b>	<b>2030</b>	<b>2035</b>
<b>Service Area Population</b>	38,403 (actual)	37,720 (actual)	37,808	38,771	39,168	39,550	40,037

Footnotes:

- <sup>a</sup> Population estimates for 2000 and 2010 were provided by AMBAG on March 28, 2011 and are based on 2000 and 2010 U.S. Census Block Level data for the SqCWD service area.
- <sup>b</sup> Population projections for 2015-2035 were calculated using the 2010 U.S. Census data as a base, and adding the incremental projected increase in population between years 2010-2015, 2015-2020, 2020-2025, 2025-2030, and 2030-2035 provided by AMBAG on February 18, 2011. The AMBAG population projections are based on the Monterey Bay Area 2008 Regional Forecast: Population, Housing Unit and Employment Projections for Monterey, San Benito and Santa Cruz Counties to the Year 2035.

The projected population estimates for 2015-2035 were derived from the Monterey Bay Area 2008 Regional Forecast: Population, Housing Unit and Employment Projections for Monterey, San Benito and Santa Cruz Counties to the Year 2035 (AMBAG, 2008). AMBAG developed the forecast at the regional level and then disaggregated to the jurisdictional level in consultation with representatives from each jurisdiction. Since the SqCWD service area boundaries do not align with jurisdictional boundaries, AMBAG used traffic analysis zone (TAZ) data to supplement their projected population estimates for the SqCWD service area. The projected population estimates and information on the methodology used by AMBAG to calculate these estimates is included as **Appendix J**.

However, SqCWD was not able to utilize the actual AMBAG population projections for years 2015-2035 due to the significant variation between the AMBAG 2008 Regional Forecast and the 2010 US Census. This variation resulted in a large increase in population between the years 2010 and 2015 that would have artificially resulted in a large spike in projected water demand. Instead, SqCWD was able to normalize the artificial spike between 2010 and 2015 by taking AMBAG's projected incremental increase in population between 2010 and 2015 and adding it to the 2010 Census baseline population of 37,720 persons to calculate the 2015 projected population. The AMBAG projected incremental increase in population between 2015 and 2020 was then added to the 2015 population to calculate the 2020 projected population, and so forth up through 2035. This method results in a projected population increase of 4.6 percent between 2010 and 2030, which is significantly under the County's Measure J growth limit of 1 percent per year, and is also under the County's internal target growth limit of 0.5% per year (J. Ricker, personal communication, September 19, 2011).

*Checklist Item #11. . . . (population projections) shall be in five-year increments to 20 years or as far as data is available (10631(a)).*

The adjusted population projections for the SqCWD service area for years 2015-2035 are shown above in **Table 2-2**. The population is projected to grow from 37,720 in 2010 to 39,550 by 2030, which is a population increase of approximately 4.6 percent over the next 20 years.

*Checklist Item #12. Describe . . . other demographic factors affecting the supplier's water management planning (10631(a)).*

AMBAG also provided forecasted housing unit and employment figures for the SqCWD service area. The projections, as shown in **Table 2-3** and included in **Appendix J**, are also derived from the AMBAG 2008 Regional Forecast.

<b>Table 2-3</b>						
<b>Projected Housing Units and Employment<sup>a</sup></b>						
	<b>2010</b>	<b>2015</b>	<b>2020</b>	<b>2025</b>	<b>2030</b>	<b>2035</b>
<b>Housing Units</b>	20,924	21,192	21,702	21,940	22,178	22,427
<b>Employment</b>	17,305	18,850	20,385	22,001	23,682	25,467

Footnote:

<sup>a</sup> The projected housing units and employment estimates were provided by AMBAG on February 18, 2011 and are based on the Monterey Bay Area 2008 Regional Forecast: Population, Housing Unit and Employment Projections for Monterey, San Benito and Santa Cruz Counties to the Year 2035 (AMBAG).

## Section 3: System Demands

This section describes the Soquel Creek Water District's (SqCWD) system demands, including baseline daily per capita water use, and interim and urban water use targets as required by the Water Conservation Bill of 2009 (SBX7-7). This section also provides a detailed description of how SqCWD calculated its baseline and targets, following the technical methods and methodologies described in Methodologies for Calculating Baseline and Compliance Urban Per Capita Water Use For the Consistent Implementation of the Water Conservation Bill of 2009 (Department of Water Resources (DWR), 2011). Background information and approach used to develop baselines and targets are included.

This section also quantifies the current water system demand by water use sector (e.g., single-family residential, multifamily residential, commercial, etc.) and projects future water demand over the planning horizon of the UWMP. Projections are also provided for water sales to and purchases from other agencies, system water losses, and water use target compliance.

### ***Required Elements — Baselines and Targets***

*Checklist Item #1. An urban retail water supplier shall include in its urban water management plan . . . the baseline daily per capita water use, urban water use target, interim urban water use target, and compliance daily per capita water use, along with the bases for determining those estimates, including references to supporting data (10608.20(e)).*

### **Baselines**

Base daily per capita water use is defined as how much water is used within an urban water supplier's distribution system area on a per capita basis, and is measured in gallons per capita per day (gpcd). SqCWD followed Methodologies 1-3 from Methodologies for Calculating Baseline and Urban Per Capita Water Use (DWR, 2011) to determine base daily per capita water use. The steps involved in this process included determining whether a 10- or 15-year base period range was applicable, selecting the range of years to be included in the 10- or 15-year and the 5-year base period ranges, determining the gross water use and service area population for each year in both base period ranges, and calculating average base daily per capita water use for each base period range.

### ***Base Period Ranges***

The first step towards determining SqCWD base daily per capita water use was to determine the number of years to be included in the first base period range (i.e., either 10 or 15 years). As SqCWD did not use recycled water in 2008 to meet any portion of its retail demand, this analysis is based on a 10-year base period range. The SqCWD 10-year base period range begins with the year 2001 and goes through the end of 2010. The 5-year base period range begins with the year 2003 and goes through the end of 2007. This information is summarized in **Table 3-1**.

Table 3-1 Base Period Ranges			
Base	Parameter	Value	Units
10- or 15-year base period	2008 total water deliveries	4,910	acre-feet
	2008 total volume of delivered recycled water	0	acre-feet
	2008 recycled water as a percent of total deliveries	0	percent
	Number of years in base period	10	years
	Year beginning base period range	2001	
	Year ending base period range	2010	
5-year base period	Number of years in base period	5	years
	Years beginning base period range	2003	
	Year ending base period range	2007	

#### *Gross Water Use*

The second step was to determine the gross water use for each year in the 10- and 5-year base period ranges. SqCWD determined system gross water use on a calendar-year basis using the process defined in Methodology 1 from Methodologies for Calculating Baseline and Compliance Urban Per Capita Water Use (DWR, 2011). Gross water use is defined as the total volume of water, whether treated or untreated, entering the distribution system of an urban retail water supplier, excluding recycled water, water placed into long-term storage, water conveyed to another urban water supplier, or water used for agricultural purposes. None of these exclusions were applied to the SqCWD gross water use totals; however, small quantities of water received from Central Water District during some of the baseline years were added into the system gross water use totals.

A schematic of the SqCWD water system is included as **Figure 3-1**. Total gross water use data is reported in **Tables 3-2** and **3-3**, for the 10- and 5-year base period ranges, respectively. It is important to note that gross water use includes water used within all SqCWD customer sectors (e.g., residential, commercial, institutional, irrigation, fire, etc.), as well as water used by SqCWD to operate and maintain the water system and distribution system losses. Past analyses of per capita water use within the service area have strictly focused on single-family and multifamily residential use. The 2010 per capita residential water usage of approximately 70 gpcd for the SqCWD service area is much less than the per capita gross water usage values shown in **Tables 3-2** and **3-3**.

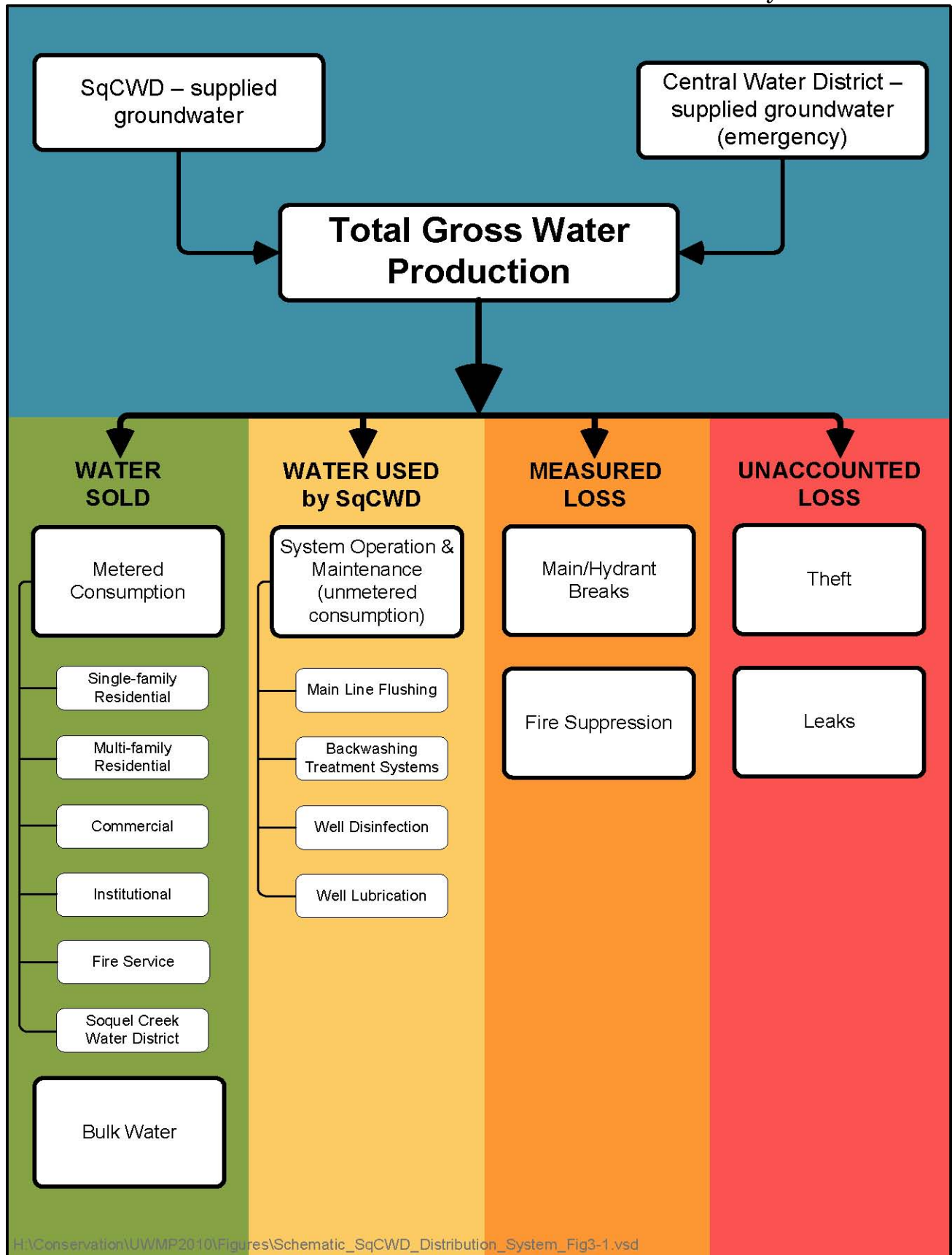


Figure 3-1 Schematic of SqCWD Distribution System

**Table 3-2**  
**Base Daily Per Capita Water Use - 10-Year Range**

Base period year		Distribution system population <sup>a</sup>	Annual SqCWD gross water use (acre-feet)	Annual water purchased from CWD (acre-feet) <sup>b</sup>	Total annual system gross water use (acre-feet)	Total annual system gross water use (gallons)	Annual daily per capita water use (gpcd) <sup>c</sup>
Sequence year	Calendar year						
Year 1	2001	37,581	5,430	0	5,430	1,769,441,711	129
Year 2	2002	37,587	5,614	0	5,614	1,829,273,596	133
Year 3	2003	37,804	5,546	0	5,546	1,807,071,250	131
Year 4	2004	37,873	5,546	0	5,546	1,807,249,549	131
Year 5	2005	38,403	4,945	0	4,945	1,611,310,909	115
Year 6	2006	38,068	4,736	1	4,737	1,543,428,779	111
Year 7	2007	38,124	5,048	10	5,058	1,648,184,336	118
Year 8	2008	38,508	4,910	1	4,911	1,600,095,246	114
Year 9	2009	38,481	4,262	22	4,284	1,395,961,651	99
Year 10	2010	37,720	4,080	4	4,084	1,330,693,695	97
<b>Average 10-year Base Daily Per Capita Water Use</b>							<b>118</b>

Footnotes:

<sup>a</sup>Distribution system population data for year 2010 was based on 2010 U.S. Census data for the service area. Population data for years 2001-2009, was based on 2000 U.S. Census data and SqCWD residential service connection data for each year. See Appendix K for more detail.

<sup>b</sup>CWD is Central Water District.

<sup>c</sup>gpcd is gallons per capita per day.

Table 3-3 Base Daily Per Capita Water Use - 5-Year Range							
Base period year		Distribution system population <sup>a</sup>	Annual SqCWD gross water use (acre-feet)	Annual water purchased from CWD (acre-feet) <sup>b</sup>	Total annual system gross water use (acre-feet)	Total annual system gross water use (gallons)	Annual daily per capita water use (gpcd) <sup>c</sup>
Sequence year	Calendar year						
Year 1	2003	37,804	5,546	0	5,546	1,807,071,250	131
Year 2	2004	37,873	5,546	0	5,546	1,807,249,549	131
Year 3	2005	38,403	4,945	0	4,945	1,611,310,909	115
Year 4	2006	38,068	4,736	1	4,737	1,543,428,779	111
Year 5	2007	38,124	5,048	10	5,058	1,648,184,336	118
Average 5-year Base Daily Per Capita Water Use							121

Footnotes:

<sup>a</sup>Distribution system population data for year 2010 was based on 2010 U.S. Census data for the service area. Population data for years 2003-2007, was based on 2000 U.S. Census data and SqCWD residential service connection data for each year. See Appendix K for more detail.

<sup>b</sup>CWD is Central Water District.

<sup>c</sup>gpcd is gallons per capita per day.

*Service Area Population*

The third step in this process was to obtain service area population estimates for each year of the 10- and 5-year base period ranges. As the SqCWD service area does not overlap substantially with jurisdictional boundaries, and therefore population data is not available for every year within the base periods, it was necessary to use U.S. Census data for years 2000, 2005 and 2010 as an anchor to develop population estimates for non-Census years. The methodology for developing non-Census year population estimates for 2001-2009 is discussed below and calculations and assumptions are included in **Appendix K**. In general, SqCWD followed the methodology provided in Appendix A - Alternative Methodology for Service Area Population, contained in Methodologies for Calculating Baseline and Compliance Urban Per Capita Water Use (DWR, 2011).

The population estimates for non-Census years were calculated by first determining the number of persons per residential unit for the SqCWD service area. SqCWD used a weighted average of 2.0 persons per unit for the City of Capitola, and 2.61 persons per unit for Unincorporated Santa Cruz County (AMBAG, 2011). According to AMBAG, these numbers were published by the State of California Department of Finance (DoF) and are an average of single- and multifamily dwelling units.

Using the 2010 U.S. Census-based estimate for the service area (37,720 persons), and the 2010 DoF-based population estimate for the City of Capitola (9,918 persons), we were able to determine the estimated Unincorporated Santa Cruz County service area population (27,802 persons). These estimates were then used to determine the percentage of the SqCWD service area population living in the City of Capitola (approximately 26 percent) and Unincorporated Santa Cruz County (approximately 74 percent). These percentages, coupled with the number of persons per unit for each respective population group, were used to calculate a weighted average of 2.45 persons per unit for the SqCWD service area.

Next, SqCWD estimated the percentage of the service area population living in single-family units versus multifamily units. This was accomplished by using the following information:

1. The available U.S. Census data for years 2000, 2005 and 2010;
2. The known number of SqCWD single-family connections for years 2005 and 2010; and
3. The calculated weighted average of 2.45 persons per unit for the service area.

By multiplying the number of single-family connections for years 2005 and 2010 by the number of persons per unit for the service area, we were able to determine that an average of 79 percent of the SqCWD service area population lives in single-family dwelling units, and 21 percent of the SqCWD service area population lives in multifamily dwelling units.

SqCWD was then able to use the above percentages, coupled with the known number of single-family connections for each non-Census year, to estimate the total annual service area population for that year. The estimated population of the service area for each year in the 10- and 5-year base periods is also reported in **Tables 3-2** and **3-3** for each year of the 10- and 5-year base periods, respectively.

*Average Base Daily Per Capita Water Use for Each Base Period Range*

The final step in determining SqCWD average base daily per capita water use for both the 10- and 5-year base period ranges was to divide the gross water use (converted from acre-feet to gallons) for each year within the range by the service area population for that same year, divided by 365 (the number of days per year). These values were then averaged for each base period range. As shown in **Table 3-2**, the SqCWD 10-year base period per capita water use is 118 gallons per capita per day (gpcd). The 5-year base period per capita water use, as shown in **Table 3-3**, is 121 gpcd.

**Urban and Interim Water Use Targets**

After determining per capita water use for each base period, a 2020 urban water use target and a 2015 interim urban water use target were established in accordance with SBX7-7.

The DWR allows urban water suppliers to choose one of four defined methods to determine the water use targets. The four methods are as follows:

1. Method 1 - 80 percent of base daily per capita water use.
2. Method 2 – performance standards-based using actual water use data for indoor residential, landscape and commercial, industrial and institutional (CII) sectors.
3. Method 3 - 95 percent of the conservation target for the Central Coast hydrologic region, as established in the 20x2020 Water Conservation Plan (DWR and others, 2010).
4. Method 4 – base daily per capita water use separated into three sectors (i.e., indoor residential, CII, and landscape, water loss and unaccounted-for water).

SqCWD selected Method 3 to determine its urban water use target for 2020 for the following reasons: (1) the 2020 target under Method 1 is more difficult achieve, especially for water suppliers like SqCWD that have had established conservation programs in place for a number of years and have already recognized significant water savings; (2) Method 2 is complex and requires data and resources that are not available to SqCWD at this time; and (3) Method 4 is also complex and was not developed until late in the UWMP update process.

Under Method 3, the water supplier's urban water use target is 95 percent of the State's 2020 conservation goal for the hydrologic region. As SqCWD is located within

the Central Coast hydrologic region, which has a 2020 conservation goal of 123 gpcd, the SqCWD's 2020 urban water use target is 117 gpcd (see Figure 3-2). However, if 95 percent of the suppliers' 5-year base period per capita water use ( $0.95 \times 121 = 115$  gpcd) is less than the Method 3 urban water use target (117 gpcd), then the final urban water use target for 2020 becomes 95% of the 5-year base period per capita water use (115 gpcd). To determine the 2015 interim water use target, SqCWD added the average 5-year base daily per capita water use (121 gpcd) to the final 2020 urban water use target for the SqCWD (115), and divided by two. Therefore, the interim urban water use target for SqCWD is 118 gpcd.

At the end of 2015, SqCWD will compare its' 2015 daily per capita water use to the interim urban water use target of 118 gpcd. At the end of 2020, the compliance daily per capita water use (i.e., the gross water use during the final year of the reporting period, reported in gallons per capita per day) will be compared to the SqCWD's urban water use target of 115 gpcd.



SOURCE: Department of Water Resources  
"2010 Final UWMP Guidebook"

Figure 3-2  
California Hydrologic Regions and 2020  
Conservation Goals

### Required Elements — Water Demands

*Checklist Item #25. Quantify, to the extent records are available, past and current water use, and projected water use (over the same five-year increments described in subdivision (a)), identifying the uses among water use sectors, including, but not necessarily limited to, all of the following uses: (A) Single-family residential; (B) Multifamily; (C) Commercial; (D) Industrial; (E) Institutional and governmental; (F) Landscape; (G) Sales to other agencies; (H) Saline water intrusion barriers, groundwater recharge, or conjunctive use, or any combination thereof; (I) Agricultural (10631(e)(1) and (2)).*

**Table 3-4** contains a breakdown of actual service connections and water deliveries by sector for years 2005 and 2010. In 2005, SqCWD had a total of 14,914 service connections, 1,072 of which were fire service connections. Total water deliveries to all sectors were 4,617 acre-feet (af) in 2005. In 2010, there were 15,417 service

connections (including 1,319 fire service connections), and 3,757 af of water was delivered. All of the water deliveries in **Table 3-4** are metered.

<b>Table 3-4</b> <b>Water Deliveries — Actual, 2005 and 2010<sup>a</sup></b>				
	<b>2005</b>		<b>2010</b>	
<b>Water use sectors</b>	<b># of accounts</b>	<b>Volume (acre-ft)</b>	<b># of accounts</b>	<b>Volume (acre-ft)</b>
Single family	12,267	2,952	12,447	2,363
Multi-family	584	748	620	591
Commercial	722	606	742	490
Industrial	0	0	0	0
Institutional/governmental	78	110	80	89
Landscape/Irrigation	167	197	182	147
Agriculture	0	0	0	0
Fire	1,072	4	1,319	66
Soquel Creek Water Dist.	24	0	27	11
<b>Total</b>	<b>14,914</b>	<b>4,617</b>	<b>15,417</b>	<b>3,757</b>

Footnote:

<sup>a</sup>All accounts are metered

Single-family residential is the largest customer sector, comprising approximately 80% of the total number of accounts, and about 65% of the total water deliveries in 2010. The multi-family residential and commercial sectors are the next largest, each accounting for about 15% of the total volume of water delivered. In 2010, the multi-family sector had about 120 fewer accounts or connections than the commercial sector, but used about 100 af more water than the commercial sector.

Projected service connections and water use by sector for years 2015, 2020, 2025 and 2030 are provided in **Table 3-5**.

<b>Table 3-5</b> <b>Water Deliveries — Projected, 2015, 2020, 2025, 2030</b>								
	<b>2015</b>		<b>2020</b>		<b>2025</b>		<b>2030</b>	
<b>Water use sectors</b>	<b># of accounts</b>	<b>acre-feet</b>	<b># of accounts</b>	<b>acre-feet</b>	<b># of accounts</b>	<b>acre-feet</b>	<b># of accounts</b>	<b>acre-feet</b>
Single family	12,531	2,574	12,615	2,541	12,700	2,462	12,786	2,382
Multi-family	624	644	628	636	633	616	637	596
Commercial	747	534	752	527	757	510	762	494
Industrial	0	0	0	0	0	0	0	0
Institutional/governmental	81	97	81	96	82	93	82	90
Landscape	183	160	184	158	186	153	187	148
Agriculture	0	0	0	0	0	0	0	0
Fire	1,328	72	1,337	71	1,346	69	1,355	67
SqCWD	27	13	27	12	28	11	28	11
<b>Total</b>	<b>15,521</b>	<b>4,092</b>	<b>15,625</b>	<b>4,041</b>	<b>15,731</b>	<b>3,914</b>	<b>15,837</b>	<b>3,787</b>

**SqCWD 2010 UWMP**  
**Section 3: System Demands**

Estimates of actual and projected additional water uses and distribution system losses are provided in **Table 3-6** for 2010. For the purposes of this report, system losses within SqCWD are further broken into two categories: 1) **Real losses** which include losses that can be reasonably estimated such as main breaks and water used for fire suppression; and 2) **Unaccounted for losses** which include leaks that have not been individually estimated. Unaccounted for losses are estimated by subtracting water deliveries, real losses and all water uses from the total water production. In 2010, real losses were estimated to use 11 af of water (less than 1 percent of gross water use), and unaccounted for losses were estimated to use 287 af or roughly 7 percent of the gross water use. **Table 3-6** also includes an estimate of actual and projected unmetered water used by SqCWD for well, treatment and distribution system operation and maintenance. Specific uses of water under this category include but are not limited to the following activities: Line flushing, well disinfection, well lubrication and treatment system regeneration.

<b>Table 3-6</b> <b>Additional Water Uses and Losses (acre-feet)<sup>a</sup></b>						
<b>Water Use<sup>b</sup></b>	<b>2005</b>	<b>2010</b>	<b>2015</b>	<b>2020</b>	<b>2025</b>	<b>2030</b>
Saline barriers	0	0	0	0	0	0
Groundwater recharge	0	0	0	0	0	0
Conjunctive use	0	0	0	0	0	0
Raw water	0	0	0	0	0	0
Recycled water	0	0	0	0	0	0
System losses (real losses)	Not Available	11	11	11	11	11
System losses (unaccounted for losses)	Not Available	287	316	311	300	289
Well/Treatment system operation <sup>c</sup>	Not Available	29	29	29	29	29
<b>Total</b>	<b>0</b>	<b>327</b>	<b>356</b>	<b>351</b>	<b>340</b>	<b>329</b>

Footnotes:

<sup>a</sup>Additional water uses and losses are projected for years 2015-2030.

<sup>b</sup>Any water accounted for in Tables 3-4 and 3-5 is not included in this table.

<sup>c</sup>Includes water used by SqCWD to flush lines, disinfect wells, backwash treatment system, etc.

As shown in **Table 3-7**, the SqCWD sold very small quantities of water to two local mutual water companies, Trout Gulch Mutual Water Company and Pure Source Water, Inc., beginning in 2008.

<b>Table 3-7</b> <b>Sales to Other Water Agencies (acre-feet)<sup>a</sup></b>						
<b>Name of Agency/Water Co.</b>	<b>2005</b>	<b>2010</b>	<b>2015</b>	<b>2020</b>	<b>2025</b>	<b>2030</b>
Pure Source, Inc.	0	0.19	0	0	0	0
Trout Gulch Mutual Water Co.	0	0.18	0	0	0	0
<b>Total</b>	<b>0.00</b>	<b>0.37</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>

Footnote:

<sup>a</sup>Sales to other water agencies are projected for years 2015-2030.

The total actual and projected water use from **Tables 3-4, 3-5, 3-6 and 3-7** is summarized in **Table 3-8**.

<b>Table 3-8</b>						
<b>Total Water Use (acre-feet)<sup>a</sup></b>						
<b>Water use</b>	<b>2005</b>	<b>2010</b>	<b>2015</b>	<b>2020</b>	<b>2025</b>	<b>2030</b>
Total water deliveries	4,617	3,757	4,092	4,041	3,914	3,787
Sales to water agencies	0	0.37	0	0	0	0
Additional water uses and losses	Not Available	327	356	351	340	329
<b>Total</b>	<b>4,617 (actual)</b>	<b>4,084 (actual)</b>	<b>4,448</b>	<b>4,392</b>	<b>4,254</b>	<b>4,116</b>

Footnote:

<sup>a</sup>Total water use is projected for years 2015-2030.

*Checklist Item #34. The water use projections required by Section 10631 shall include projected water use for single-family and multifamily residential housing needed for lower income households, as defined in Section 50079.5 of the Health and Safety Code, as identified in the housing element of any city, county, or city and county in the service area of the supplier (10631.1(a)).*

A new requirement in the 2010 UWMP is to include projected water use for low income single-family and multifamily housing in water use projections for the service area. The intent of this requirement is to ensure that new low income housing developments have adequate water supply. Using the historical average that 40% of the SqCWD households are classified as low income as an indicator of future proportions, the projected population increases (see Table 2-2), and the baseline per capita water use of 0.122 acre-feet/year (Table 4-1), the estimated water demand from future low income residents is provided in **Table 3-9**. The SqCWD developed Resolution No. 06-18 titled “Resolution for Establishing Policies and Procedures for Water Service for Affordable Housing Projects”, which grants a priority for the provision of water for low income housing.

<b>Table 3-9</b>				
<b>Low Income Projected Water Demand (acre-feet)</b>				
<b>Low income water demands</b>	<b>2015</b>	<b>2020</b>	<b>2025</b>	<b>2030</b>
Single-family and Multi-family Residential	5	47	19	19

### ***Required Elements — Water Demand Projections***

*Checklist Item #33. Urban water suppliers that rely upon a wholesale agency for a source of water shall provide the wholesale agency with water use projections from that agency for that source of water in five-year increments to 20 years or as far as data is available. The wholesale agency shall provide information to the urban water supplier for inclusion in the urban water supplier's plan that identifies and quantifies, to the extent practicable, the existing and planned sources of water as required by subdivision (b), available from the wholesale agency to the urban water supplier over the same five-year increments, and during various water-year types in accordance with subdivision (c). An urban water supplier may rely upon water supply*

*information provided by the wholesale agency in fulfilling the plan informational requirements of subdivisions (b) and (c) (10631(k)).*

This requirement is not applicable. SqCWD does not currently receive any water from wholesale suppliers and does not anticipate receiving any water from wholesale suppliers in the future.

***Required Elements — Water Use Reduction Plan***

*Checklist Item #2. Urban wholesale water suppliers shall include in the urban water management plans . . . an assessment of their present and proposed future measures, programs, and policies to help achieve the water use reductions required by this part (10608.36). This requirement is not applicable as SqCWD is not a wholesale water supplier.*

## **Section 4: System Supplies**

The Soquel Creek Water District (SqCWD) currently receives 100 percent of its water supply from groundwater sources. This section describes the existing groundwater sources, including a physical description of the Soquel-Aptos area, the Groundwater Management Plan for the area, and future planned use of these sources. SqCWD water demand projections for years 2015 through 2030 are provided at the requested five-year intervals, and methodology used to calculate the projections is also included. In accordance with subdivision (a) of Section 10635 of the Water Code, this section provides an accounting of how SqCWD intends to meet the total projected water demand through 2030.

As previously discussed in Section 2, the SqCWD adopted a final Integrated Resources Plan (IRP) in 2006. Implementation of the IRP includes a comprehensive groundwater management program that is set forth in the Groundwater Management Plan -2007 for the Soquel-Aptos Area. While all components of the IRP are summarized in detail in Section 2, this section focuses on groundwater management and the evaluation and potential development of a regional seawater desalination facility with the City of Santa Cruz. The SqCWD continues to evaluate the desalination project to meet water demand in average, single-dry, and multiple-dry water years, with its primary purpose being to reduce groundwater pumping and allow groundwater to recover to protective levels. An estimate of the increase in supply associated with this proposed project, and a detailed status on elements of this project are also provided.

Lastly, this section includes a discussion of potential opportunities for short- and long-term exchanges and transfers of water, and for the future use of recycled wastewater. Both of these alternatives were evaluated during development of the draft IRP; however, feasibility studies conducted at the time concluded that neither warranted inclusion in the final 2006 IRP. Nonetheless, SqCWD has continued to re-evaluate these alternatives. This section includes a discussion of the conceptual findings from the most recent SqCWD study related to reuse of recycled wastewater, and findings from a preliminary Santa Cruz County Environmental Health Agency (SCCEH) study on the potential for water transfers/exchanges with the City of Santa Cruz. As SqCWD does not receive water from wholesale suppliers, nor supply wholesale-level quantities of water to other water providers, UWMP requirements related to wholesale suppliers are not applicable.

### ***Required Elements — Water Sources***

*#13. Identify and quantify, to the extent practicable, the existing and planned sources of water available to the supplier over the same five-year increments described in subdivision (a) (10631(b)).*

## Existing Water Sources

The SqCWD currently relies solely on groundwater from aquifers located within two geologic formations that underlie the SqCWD service area. The Purisima Formation (Purisima) provides about two-thirds of the SqCWD's annual average production of 4,615 acre-feet (af) (based on 2006-2010 production data), whereas the Aromas Red Sands (Aromas) aquifer typically provides the remaining one-third of the annual average production.

SqCWD has never received water from a wholesale water supplier (defined as a supplier that provides more than 3,000 af of water annually at wholesale prices for potable municipal purposes); however, there are emergency interties with both the Central Water District (CWD) and City of Santa Cruz Water Department (SCWD) systems that allow limited water exchanges. SqCWD received small volumes of groundwater (approximately 37 af over the five-year period of 2006-2010) from Central Water District (CWD) to help meet demands that have affected service area 3 due to well malfunction(s) and/or planned distribution system maintenance and upgrades.

In the future, SqCWD does not expect to receive any water from wholesale suppliers, but will maintain agreements with CWD and SCWD to provide and receive water on an emergency or as-needed basis to address production shortages. Additionally, SqCWD has not exported wholesale-level quantities of water to other urban water purveyors and does not expect to become a wholesale water supplier at any time in the future. SqCWD has entered into emergency service agreements with two adjoining mutual water companies, Trout Gulch Mutual and Pure Source Water Inc., and the local community college, Cabrillo College. Small quantities of water (less than one af) have been occasionally provided to the mutual water companies on a short-term, emergency basis over the past three years as reported in Table 3-7.

## Planned Water Sources and Projected Demand

**Table 4-1** provides an estimate of projected water demand (prior to factoring in anticipated savings from conservation and other influencing factors, e.g., social, economic and political), an estimate of anticipated cumulative savings, an adjusted projected demand after subtraction of estimated savings, and an estimate of supplemental supply needs for each 5-year interval from 2015 through 2030. The supplemental supply needs are based on the difference between the adjusted projected demand and the long-term target groundwater production goal of approximately 3,000 afy. (Note: The long-term target groundwater production goal of 3,000 afy is based on the most recent report from SqCWD's hydrologist (HydroMetrics WRI, 2011) that indicates that SqCWD's portion of the sustainable yield of the Purisima is 2,500 afy, and SqCWD's portion of the sustainable yield of the Aromas could be just a few hundred acre-feet, which is significantly less than the 1,800 afy previously projected. This value is the best available current estimate

and is still being refined.) The estimated supplemental supply needs do not include temporary additional pumping reductions needed to restore the basin to protective levels.

The projected water demand was calculated using an average of production data from 2004 through 2008 (5,039 af) representing “normal” demand, and an average of 2009 through 2010 production data (4,184 af) representing “abnormal” demand. This distinction between the two time periods was made to account for the unsustainable factors that undoubtedly reduced water demand in 2009 and 2010, including but not limited to the following: (1) an economic recession and subsequent residential foreclosures and declines in the commercial sector; (2) weather patterns that reduced peak irrigation demand; (3) a voluntary 15 percent curtailment in the summer of 2009; and (4) outstanding water demand offset credits.

The difference in demand between the two averaged periods is 855 af. SqCWD was not able to discern the exact impact each of these factors had on the reduction in demand between the selected time periods; however, it was conservatively estimated that at least one-half of the demand reduction (i.e.,  $0.5 \times 855 \text{ af} = 428 \text{ af}$ ) will not be sustainable in the future. The unsustainable demand value of 428 af was added back to the average 2009-2010 production rate of 4,184 af to obtain a representative baseline demand value of 4,612 af which was rounded to 4,610 af. This demand value, coupled with the 2010 U.S. Census-based service area population estimate of 37,720 persons, was used to calculate a baseline per capita demand value of 0.122 af/person/year. The baseline per capita demand value of 0.122 af was multiplied by service area population estimates for 2015, 2020, 2030 and 2035 to determine projected demand for each five-year interval.

Table 4-1 also shows the anticipated cumulative savings projected for each 5-year interval. Cumulative savings were estimated using a semi-quantitative forecasting evaluation referred to as “Social, Economical, Political, Technological” or “SEPT”. Additional information on the SEPT evaluation is included in **Appendix L**. Using this methodology, a cumulative 15 percent water savings was estimated between 2010 and 2030. For planning purposes, the water savings are estimated to occur in linear fashion over the 20-year period at 3.75 percent every five years, or 0.75% per year. This value was applied to the projected demand for each five-year interval to determine the anticipated cumulative savings. The savings was subtracted from the projected demand for each interval to determine the adjusted projected demand after savings. The 2030 projected demand is estimated to be 4,116 af, which is an 11 percent reduction from the baseline demand value of 4,610 af. Supplemental supply needs for 2020, 2025 and 2030 have been estimated by subtracting the 3,000 afy long-term target groundwater production goal from the adjusted projected demand. Note that the amount of groundwater pumping to achieve basin recovery may be less than 3,000 afy.

**Table 4-1**  
**Projected Water Supply and Demand for 2015 – 2030 (acre-feet/year)**

	<b>2010 Production</b>	<b>Baseline Demand<sup>a</sup></b>	<b>2015</b>	<b>2020</b>	<b>2025</b>	<b>2030</b>
<b>Demand Projection Start Point (acre-feet)</b>	4,084 (actual)	4,610				
<b>Estimated Population of Service Area (persons)<sup>b</sup></b>	37,720 (actual)	37,720 (actual)	37,808	38,771	39,168	39,550
<b>Baseline Per Capita Usage (acre-feet/yr/person)</b>	0.108	0.122				
<b>Projected Demand (before anticipated savings) (acre-feet)</b>			4,621	4,738	4,787	4,834
<b>Anticipated Cumulative Savings (acre-feet)<sup>c</sup></b>			173	347	533	718
<b>Adjusted Projected Demand (after anticipated savings) (acre-feet)</b>			4,448	4,392	4,254	4,116
<b>Estimated Target Groundwater Production Goal (acre-feet)<sup>d</sup></b>				3,000	3,000	3,000
<b>Supplemental Supply Needs (based on adjusted projected demand) (acre-feet)</b>			0	1,392	1,254	1,116

Footnote:

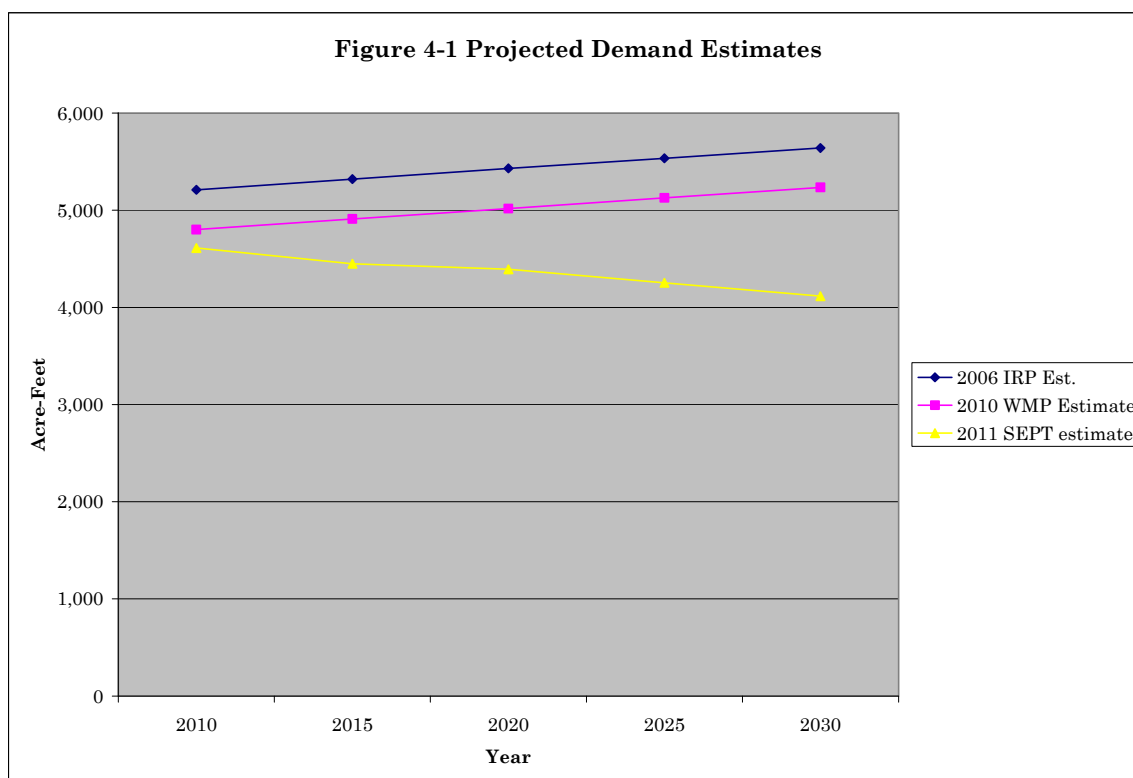
<sup>a</sup> Baseline demand was calculated using an average of the 2004-2008 average production and the 2009-2010 average production. The rationale for this approach is provided in the text.

<sup>b</sup> The estimated 2010 service area population is based on 2010 U.S Census data for the service area (AMBAG, 2010). Projected population estimates use the 2010 Census-based population estimate as a base. Projected incremental increases in population between each five-year period (AMBAG, 2010) were added to the base population. Methodology for calculating estimated population projections is provided in Section 2.

<sup>c</sup> Anticipated cumulative savings from conservation and other factors do not include savings achieved prior to 2010. Cumulative savings were estimated using a semi-quantitative forecasting evaluation referred to as “Social, Economical, Political, Technological” or “SEPT”. Using this methodology, an additional 15% water savings is estimated for 2010 through 2030. For planning purposes, the savings are estimated to occur in a linear fashion over the 20-year period at 3.75% every 5 years, or 0.75% per year. This value was applied to the projected demand estimate for each five-year period.

<sup>d</sup> The estimated target groundwater production goal of 3,000 afy is based on the most recent report (HydroMetrics WRI, 2011) indicating that SqCWD’s portion of the sustainable yield of the Purisima Formation is approximately 2,500 afy and SqCWD’s portion of the sustainable yield of the Aromas Red Sands Aquifer could be just a few hundred acre-feet. The groundwater yield (or supply) to achieve basin recovery may be less than 3,000 afy.

**Figure 4-1** demonstrates how the demand projections (adjusted with conservation savings) shown above in Table 4-1 compare to earlier demand projections made in the 2006 IRP and the 2011 Well Master Plan (WMP). The decrease shown in the current demand projections can likely be attributed to two significant factors: (1) declines in annual water production due to conservation and other factors, and (2) decreases in baseline population estimates. The decreases in baseline population estimates reflect the use of different and potentially more accurate methodology in the current projections, and an actual 4 percent decrease in the U.S. Census population estimates between 2000 and 2010 for Unincorporated Santa Cruz County.



**Table 4-2** illustrates how implementation of the Integrated Resources Plan would meet the projected water demand after accounting for savings, for each 5-year interval as shown in Table 4-1.

<b>Table 4-2 Current &amp; Projected Water Supplies (acre-feet/year)</b>					
	<b>2010</b>	<b>2015</b>	<b>2020</b>	<b>2025</b>	<b>2030</b>
<b>Adjusted Demand (after savings)</b>	4,084 (actual)	4,448	4,392	4,254	4,116
<b>Planned Sources of Water:</b>					
<b>Supplier-produced groundwater</b>	4,080	4,448	3,000	3,000	3,000
<b>Supplier-produced surface water</b>	0	0	0	0	0
<b>Transfers in<sup>a</sup></b>	4	0	0	0	0
<b>Exchanges in</b>	0	0	0	0	0
<b>Desalinated water</b>	0	0	1,392	1,254	1,116
<b>Recycled water</b>	0	0	0	0	0
<b>Wholesale suppliers</b>	0	0	0	0	0

Footnote:

<sup>a</sup> Based on an initial feasibility study prepared by Santa Cruz County Environmental Health Services Agency, up to 340 acre-feet/year may be available to SqCWD at some point in the future. Water transfers are discussed in more detail later in this section.

### ***Required Elements — Groundwater***

*#4. (Is) groundwater . . . identified as an existing or planned source of water available to the supplier . . . (10631(b))?*

Groundwater is currently the only source of water for the SqCWD. This source is directly obtained by the SqCWD, with the exception of a small quantity (i.e., approximately 37 af of groundwater over the last five-year period) that has been provided by CWD during times of production shortage due to SqCWD well malfunction and/or planned distribution system maintenance and upgrades.

It is anticipated that groundwater will continue to provide the majority of the SqCWD's supply through the year 2030. SqCWD plans to improve the existing groundwater well infrastructure and redistribute pumping inland through

implementation of the Well Master Plan (ESA, 2011); however, there are no plans to increase production of groundwater or develop additional groundwater resources due to overdraft within the Soquel-Aptos area.

*#15. (Provide a) copy of any groundwater management plan adopted by the urban water supplier, including plans adopted pursuant to Part 2.75 (commencing with Section 10750), or any other specific authorization for groundwater management (10631(b)(1)).*

Electronic copies of the Groundwater Management Plan-2007 for the Soquel-Aptos Area (SqCWD and CWD, 2007,) and the Well Master Plan (ESA, 2011) are included in **Appendix M** of this 2010 UWMP.

*#16. (Provide a) description of any groundwater basin or basins from which the urban water supplier pumps groundwater (10631(b)(2)).*

The SqCWD extracts groundwater from the Soquel-Aptos area. This area comprises four DWR designated basins:

- ☐ DWR Basin 3-1:                Soquel Valley
- ☐ DWR Basin 3-21:            Santa Cruz Purisima Formation Highlands
- ☐ DWR Basin 3-26:            West Santa Cruz Terrace
- ☐ DWR Basin 3-2:             Pajaro Valley

These same groundwater sources are also pumped by the City of Santa Cruz Water Department, Central Water District and numerous mutual water companies and private wells. Water production data are generally only available from the public water agencies; however, there has been some effort to extrapolate total production based on land use. A study conducted in 2004 estimated that SqCWD pumps approximately 60 percent of the total annual groundwater yield from the Soquel-Aptos area (see **Figure 4-2**), with the remaining 40 percent pumped by all other users of the Basin (Johnson et al., 2004).

The groundwater underlying the Soquel-Aptos area is comprised of two separate water-bearing units, the Purisima and the Aromas aquifer. **Figure 4-3** shows a geological cross-section of the groundwater units underlying the SqCWD service area. Due to the proximity of the basin to the Monterey Bay, these groundwater formations have offshore ocean outcrops, which present opportunities for seawater intrusion along the coast (ESA, 2011).

### **The Purisima Formation**

The SqCWD extracts groundwater from the deep water-bearing zones within the Purisima, a 2,000-foot-thick body of sandstone interbedded with layers of siltstone and claystone (ESA, 2011). The Purisima consists of at least nine distinct geologic units which vary in thickness and hydrogeologic characteristics. Some of the units

within this formation transmit and store groundwater more effectively than others, and some act as aquitards. The Unit A Aquifer is the most consistently coarse-grained aquifer within the Purisima and is distinct and highly permeable (HydroMetrics, 2008). Several SqCWD wells are screened within this unit; however, SqCWD also operates production wells within most of the other units.

#### **The Aromas Red Sands Aquifer**

The SqCWD extracts groundwater from the semi-confined and unconfined units of the Aromas, a 400-foot thick aquifer divided into two units (Qua and Qla). The Qua, or uppermost unit is about 225-feet thick, and the Qla, or lowermost unit is about 175-feet thick. All of the SqCWD production wells in the Aromas are screened in the lowermost unit. The Aromas aquifer is composed of interbedded layers of silt and clay, and it overlies the Purisima within portions of the SqCWD service area.

*#17. For those basins for which a court or the board has adjudicated the rights to pump groundwater, (provide) a copy of the order or decree adopted by the court or the board (10631(b)(2)).*

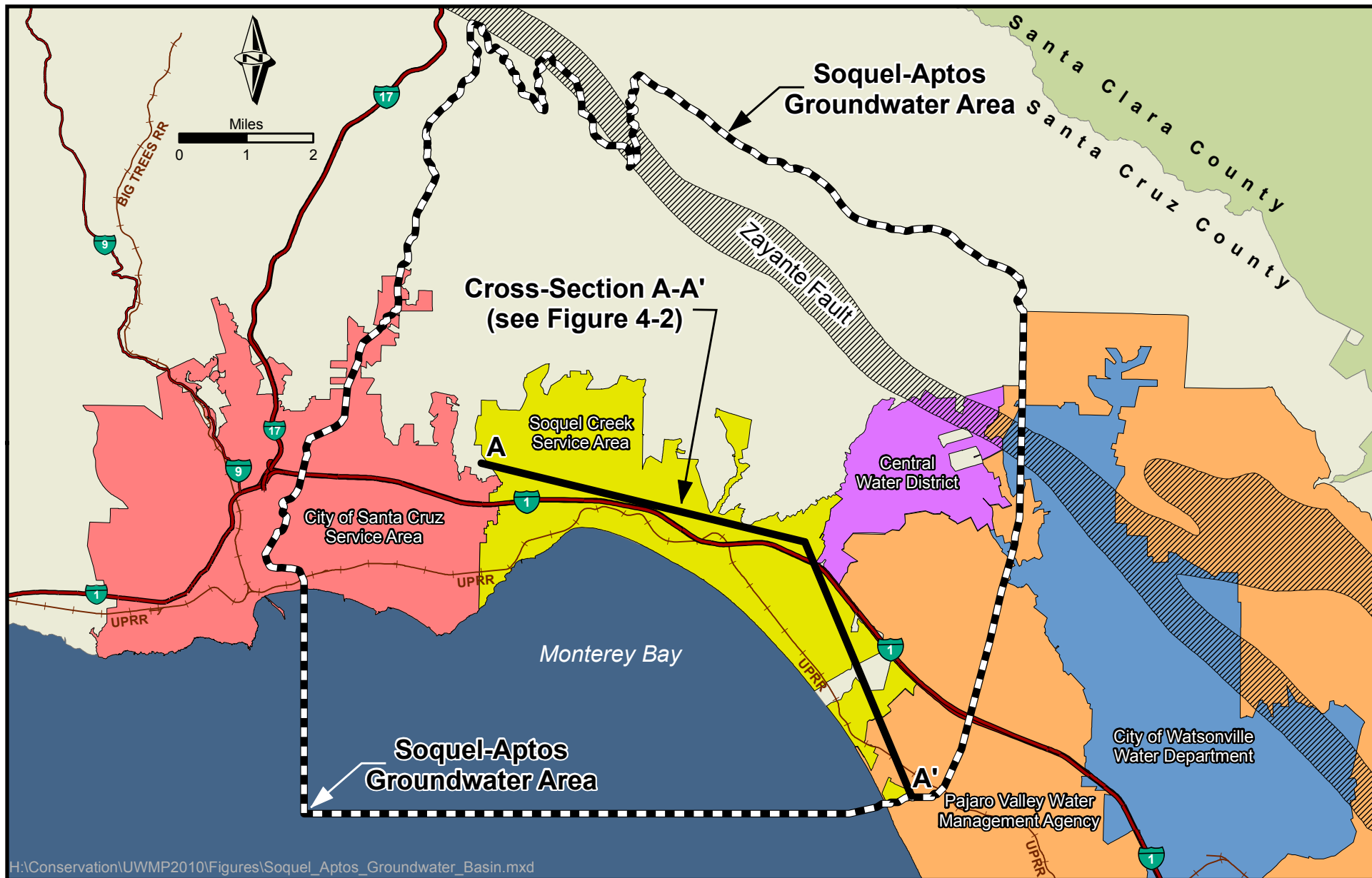
This requirement is not applicable as groundwater in the Soquel-Aptos area is not adjudicated.

*#18. (Provide) a description of the amount of groundwater the urban water supplier has the legal right to pump under the order or decree (10631(b)(2)).*

This requirement is not applicable as groundwater within the Soquel-Aptos area is not adjudicated.

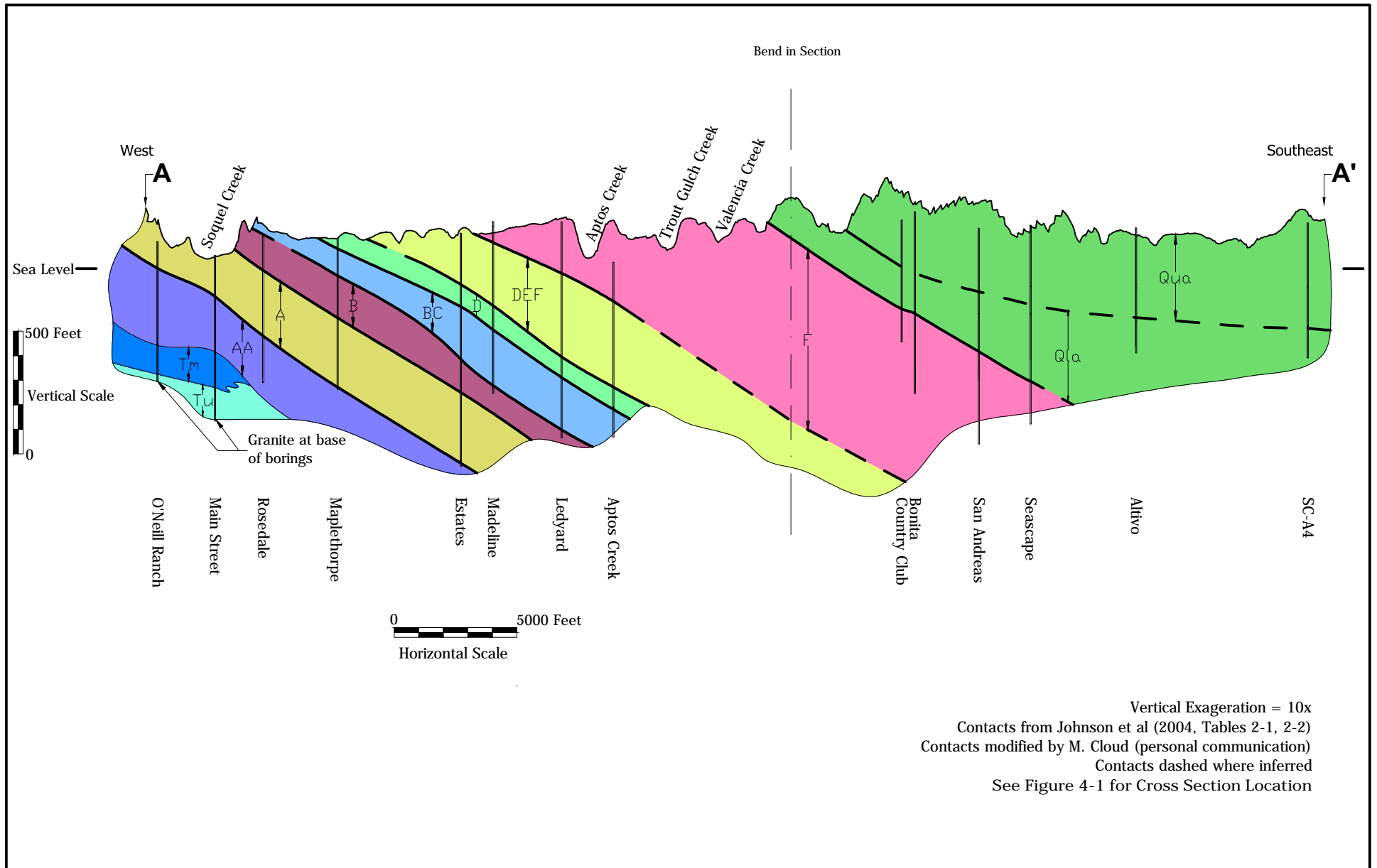
*#19. For basins that have not been adjudicated, (provide) information as to whether the department has identified the basin or basins as overdrafted or has projected that the basin will become overdrafted if present management conditions continue, in the most current official departmental bulletin that characterizes the condition of the groundwater basin, and a detailed description of the efforts being undertaken by the urban water supplier to eliminate the long-term overdraft condition (10631(b)(2)).*

In 1978, the Department of Water Resources (DWR) was tasked with defining critical overdraft and identifying groundwater basins that were in critical overdraft, as required under Water Code §12924. In 1980, the DWR published Bulletin 118-80, Ground Water Basins in California, in which critical overdraft was defined and 11 basins were identified as being in a critical condition of overdraft. The Soquel-Aptos area was not identified in the 1980 Bulletin, and insufficient funding prevented the DWR from evaluating additional basins in the 2003 update. Under the authority of Assembly Bill 3030 (1992) and Senate Bill 1938 (2002), SqCWD entered into a Joint Powers Agreement with Central Water District to provide local management of the groundwater resources and has proceeded with addressing overdraft conditions in the absence of any State mandates to do so.



SOURCE: Soquel Creek Water District, 2011

Figure 4-2  
Soquel-Aptos Groundwater Area



SOURCE: Hydrometrics, WRI  
 "Groundwater Management Plan - 2007, Soquel-Aptos Area"

**Figure 4-3**  
**Geological Cross-Section A-A'**

While not formally categorized as a critically overdrafted basin in Bulletin 118-80, hydrogeologic studies conducted by HydroMetrics WRI (2011) conclude that coastal groundwater levels are below elevations that protect the Soquel-Aptos area from seawater intrusion, therefore creating a state of overdraft (HydroMetrics LLC, 2009a). This potential for seawater intrusion indicates that collective pumping by the SqCWD, the City of Santa Cruz, Central Water District, and other public and private users has exceeded the sustainable groundwater yield of the Soquel-Aptos area over the long term. Hydrogeologic studies conducted in 2004 estimated that the sustainable yield for SqCWD was not more than 4,800 acre-feet/year (afy) with 3,000 afy available from the Purisima, and 1,800 afy available from the Aromas (Johnson et al., 2004) and these values were set as SqCWD's pumping goals in the Soquel-Aptos Groundwater Management Plan (ESA, 2007). However, a study of outflow needed to achieve protective groundwater levels concluded that the previous estimate of 4,800 afy is likely hundreds of acre-feet per year too high to protect against seawater intrusion after groundwater levels recover to protective elevations. (HydroMetrics LLC, 2009b)

Recent modeling and evaluations by HydroMetrics WRI (2011) indicate that SqCWD's portion of the sustainable yield in the Purisima is approximately 2,500 afy (500 afy less than previous estimates) and SqCWD's portion of the sustainable yield in the Aromas could be just a few hundred acre-feet, which is significantly less than the 1,800 afy previously projected. In order to recover groundwater levels to protective elevations and eliminate overdraft, SqCWD must temporarily reduce pumping to levels below its portion of the sustainable yield (HydroMetrics WRI, 2011) and other pumpers must not further impact the overdrafted portion of the basin.

In response to continuing overdraft conditions, SqCWD is advocating conservation and pursuing a supplemental supply. SqCWD also completed a Well Master Plan and will be developing up to five new wells over the next five or so years to redistribute pumping inland. Additionally, groundwater modeling and evaluations are still underway to more fully characterize protective elevations and the sustainable yield within portions of the Aromas aquifer used by SqCWD.

*#20. (Provide a) detailed description and analysis of the location, amount, and sufficiency of groundwater pumped by the urban water supplier for the past five years. The description and analysis shall be based on information that is reasonably available, including, but not limited to, historic use records (10631(b)(3)).*

The volume of groundwater pumped from the Soquel-Aptos area by the SqCWD for years 2006 -2010 is provided below in **Table 4-3**. SqCWD was able to consistently meet the demands during this period; however, ongoing groundwater production at current and projected levels of demand is not sustainable.

<b>Table 4-3</b> <b>Groundwater Pumped by Soquel Creek Water District, 2006-2010</b> <b>(acre-feet/year)<sup>a</sup></b>					
Groundwater Source	2006	2007	2008	2009	2010
Purissima Aquifer	2,965	3,151	3,134	2,867	2,803
Aromas Red Sands Aq.	1,771	1,897	1,776	1,395	1,277
Total (Purissima + Aromas Red Sands)	4,736	5,048	4,910	4,262	4,080
Groundwater as a percent of total water supply	100%	100%	100%	100%	100%

Footnote:

<sup>a</sup> Volumes are based on volumetric meter data. Totals do not include small volumes (approx. 37 af) of water pumped by and purchased from Central Water District.

*#21. (Provide a) detailed description and analysis of the amount and location of groundwater that is projected to be pumped by the urban water supplier. The description and analysis shall be based on information that is reasonably available, including, but not limited to, historic use records (10631(b)(4)).*

The volume of groundwater projected to be pumped from the Soquel-Aptos area by the SqCWD for year 2015 and each 5-year increment thereafter, is provided below in **Table 4-4**. The projected demand is shown prior to factoring in anticipated savings and after adjusting for anticipated savings. The methodology used to determine the projected demand is discussed at the start of this section under Checklist Item #13.

<b>Table 4-4</b> <b>Groundwater Projected to be Pumped from Soquel-Aptos Area</b> <b>(acre-feet/year)</b>					
	2010	2015	2020	2025	2030
Projected Demand (before anticipated savings)		4,621	4,738	4,787	4,834
Adjusted Projected Demand (after anticipated savings)	4,084 (actual) 4,610 (baseline)	4,448	4,392	4,254	4,116
Quantity Provided by Groundwater Sources		4,448	3,000	3,000	3,000
Percent of total water supply	100%	100%	68%	71%	73%

As previously discussed, SqCWD is beginning to implement the Well Master Plan to improve the management of its existing groundwater resources by making necessary infrastructure improvements. Improvements include the development of up to four new wells, the conversion of an existing irrigation well to a municipal well, the abandonment and destruction of one deteriorated production well, and the removal of two wells from production and the maintenance of those wells as inactive wells. The goal of the Well Master Plan is not to increase total volumetric groundwater production, but rather to improve management of existing groundwater resources and redistribute pumping away from the coast. There are currently no plans to expand the groundwater supply.

***Required Elements — Transfer Opportunities***

*#24. Describe the opportunities for exchanges or transfers of water on a short-term or long-term basis (10631(d)).*

The only short-term opportunities that exist for water transfers into the SqCWD service area are transfers from the CWD through two existing interties and with the City of Santa Cruz through three small existing interties. All of these existing interties permit only relatively small volumes intended to supplement the SqCWD's supply during production shortages caused by mechanical failure, planned maintenance activities, or other emergencies. It is anticipated that these small-volume transfers will continue to be available on an as-needed basis over the long-term. There are currently no short-term transfer opportunities that would provide for larger volumes of water on a regular basis.

Although SqCWD will continue to pursue potential water transfer opportunities, we do not currently foresee the transfer of groundwater out of the service area on a short-term or long-term basis due to existing overdraft conditions and the absence of a supplemental supply. However, on a short-term basis, we may transfer water through existing interties to support CWD, the City of Santa Cruz or adjoining mutuals in the event of an emergency. Supplemental supply projects currently being evaluated (i.e., the desalinated water and/or the regional surface water transfer opportunities described below) could possibly allow future transfers without dangerously exacerbating groundwater overdraft, but the feasibility, frequency and volume of such transfers have not yet been determined.

SqCWD evaluated potential long-term exchange opportunities with the City of Santa Cruz in past studies and concluded that water exchanges were not feasible at the time for the following reasons: (1) Surplus water from the City was limited and unreliable (i.e., they have little or no surplus in below-average rainfall years and during drought years, they project a supply shortfall of about 45%); (2) The City water supply was susceptible to quality issues during high flow due to turbidity; (3) There were significant issues associated with permitting and reopening water rights; and (4) SqCWD did not foresee being able to provide any water in exchange due to the groundwater overdraft in the Soquel-Aptos area.

Despite the limitations and challenges, the City and SqCWD support further evaluation of a regional surface water transfer as a means of maximizing beneficial use of existing water supplies. Recently, with funding provided by the Integrated Regional Water Management Planning Grant, the Santa Cruz County Environmental Health Services Agency (SCCEH) initiated a reevaluation of the feasibility of transferring excess winter streamflow from the City of Santa Cruz's intake on the San Lorenzo River to reduce groundwater overdraft within both SqCWD and the Scotts Valley Water District service areas. The results of this preliminary reevaluation are discussed in a memo from Mr. John Ricker, SCCEH Water Resources Division Director (May 11, 2011) that is included as **Appendix N**

Preliminary estimated yield to SqCWD from the conceptual water transfer from the City of Santa Cruz is an average of 340 afy. This is only about 20% of the amount of supplemental supply needed to recover and sustain the groundwater basin. The estimated yield is based on the SCCEH's assumption that Scotts Valley Water District would have the higher priority for receiving water because: (1) The underlying Santa Margarita groundwater basin is in the same watershed as the San Lorenzo River; (2) The Santa Margarita basin is a smaller basin that would recover more quickly with reductions in pumping; and (3) A recovery of groundwater levels in the Santa Margarita basin would allow for more immediate fish benefits in terms of increased summer baseflow in Bean Creek (a tributary of the San Lorenzo River).

It is currently unknown whether SqCWD would be able to negotiate a higher allocation of water. In addition to the relatively low yield that may be available to SqCWD based on the assumed allocation priority, there are a number of uncertainties associated with a water transfer that still require further evaluation, including but not limited to the following: minimum stream flows required for fish habitat; the process and length of time required to amend the point of use within the City of Santa Cruz's existing water rights; and future effects of climate change on precipitation, runoff and recharge.

While a future surface water transfer may potentially constitute a small portion of SqCWD's overall supply portfolio, additional studies and time are needed to further evaluate uncertainties, refine total yield estimates and allocation priorities, perform cost-benefit analyses and evaluate the feasibility and impacts of exporting groundwater from the Soquel-Aptos area to the City of Santa Cruz during critical drought. The SCCEH plans to continue studying this option, as well as other conjunctive use projects within the region. SqCWD will continue to assist the SCCEH by providing relevant information in support of these efforts, and, as a partner in the Northern Santa Cruz County Integrated Water Management Region along with SCCEH, the City Of Santa Cruz and Scotts Valley Water District, SqCWD will be in a position to support and benefit from any grant funding to implement the proposed surface water transfer project.

The transfer and exchange opportunities discussed above are summarized in **Table 4-5**.

<b>Table 4-5 Transfer and Exchange Opportunities</b>			
<b>Participating Agency</b>	<b>Transfer or Exchange</b>	<b>Short-term or Long-term</b>	<b>Proposed Volume (Acre-Feet/Year)</b>
Central Water District	Reciprocal transfer in the event of emergency or production shortage	Short-term	Small volumes only
City of Santa Cruz	Reciprocal transfer in the event of emergency or production shortage	Short-term	Small volumes only
City of Santa Cruz	Transfer with possible exchange	Long-term	340 afy <sup>a</sup>

Footnote:

<sup>a</sup>Based on initial feasibility study prepared by SCCEH.

### ***Required Elements — Desalinated Water Opportunities***

*#31. Describe the opportunities for development of desalinated water, including, but not limited to, ocean water, brackish water, and groundwater, as a long-term supply (10631(i)).*

The SqCWD has been evaluating conjunctive use with a new supplemental water supply for more than 20 years. After consideration of numerous water supply alternatives through a Public Advisory Committee that prepared the SqCWD's 1999 draft IRP, and the 2006 adoption of a final IRP, seawater desalination was identified as the best option for a supplemental water supply that would have sufficient yield and reliability to address the groundwater overdraft issue. As the City of Santa Cruz concurrently went through a similar process in their Integrated Water Plan (Fiske & Associates, 2003) and also identified seawater desalination as their preferred option, the two agencies formed the **scwd**<sup>2</sup> Desalination Program to jointly evaluate and plan for a shared 2.5 million gallon per day (mgd) desalination project. The proposed project would reduce reliance on an overdrafted groundwater supply, protect against seawater intrusion, and provide much needed water during droughts.

The **scwd**<sup>2</sup> has had an extensive public outreach program over the last two years to provide information on the local water supply conditions, past water supply planning studies, and many aspects of building and operating a desalination plant. On November 15, 2010, a Notice of Preparation/Initial Study was published, thereby launching a 45-day scoping comment period under the California Environmental Quality Act. During the scoping period, the **scwd**<sup>2</sup> received comments from the public and various agencies regarding the potential environmental effects to be evaluated in the project's draft Environmental Impact Report (EIR). A draft EIR is currently being prepared and is anticipated to be released in early 2012. Upon release of the draft EIR, public meetings will be held and a public comment period will be established.

More details about the proposed seawater desalination project are provided in the Future Water Projects portion at the end of this section and in Section 2 of this UWMP.

***Required Elements — Recycled Water Opportunities***

*#44. Provide, to the extent available, information on recycled water and its potential for use as a water source in the service area of the urban water supplier. The preparation of the plan shall be coordinated with local water, wastewater, groundwater, and planning agencies that operate within the supplier's service area (10633).*

The SqCWD does not currently treat or reclaim any wastewater. Most wastewater generated from within the SqCWD service area is treated at the City of Santa Cruz's regional wastewater treatment plant located approximately 5 miles west of the SqCWD's service area boundary. Small quantities of wastewater from the Los Barancos residential development in Aptos and the Sand Dollar Beach and Canon del Sol residential developments in La Selva Beach are sent to package wastewater treatment units operated by the Santa Cruz County Water and Wastewater Operations Division. There are also some septic systems located within the SqCWD service area.

The City of Santa Cruz regional wastewater treatment plant, which receives the bulk of wastewater from SqCWD customers, currently treats to levels classified as Disinfected Secondary – 23, under Title 22 of the California Code of Regulations (CCR). Although the City's treated water is potentially suitable for some agricultural applications and for limited public access irrigation, the City is not currently permitted to produce recycled water for use offsite. However, recycled water has been used inside the plant since 1998 to meet its major process water needs including chemical mixing, contact and non-contact cooling water, equipment washing and heating.

The City of Santa Cruz has evaluated the potential for using recycled water as a supplemental water supply in their Alternative Water Supply Study (Carollo Engineers, 2000) and Evaluation of Regional Water Supply Alternatives (Carollo Engineers, 2002). In these studies, five potential recycled water projects were evaluated and all were eventually discounted at the time due to a number of factors. The factors included regulatory limitations on the use of recycled water, project opposition, limited yield and high cost.

As the costs would be even greater for SqCWD due to the lengthy conveyance facilities that would be needed, cost is also a prohibiting factor for the SqCWD. The various legal requirements for using recycled water for groundwater recharge also limit the opportunities within the SqCWD. The limitations regarding groundwater recharge include additional treatment requirements, the requirement to blend the recycled water with at least 50 percent potable water prior to recharge, and siting requirements specifying that recharge locations be set at minimum distances from

other public or private drinking water wells. Other impediments to the use of recycled water within the service area include a very limited irrigation market, and limited opportunities for developing large tracts of land where dual-plumbing could cost-effectively be installed.

In spite of the potential limitations associated with the use of recycled water within the service area, SqCWD conducted a Water Recycling Facilities Planning Study (Black & Veatch, 2009) to evaluate the feasibility of providing recycled water to sites with large landscapes through satellite reclamation plants (SRPs). SRPs are a promising alternative to traditional water recycling facilities constructed as part of a wastewater treatment plant, in that they may be placed directly at or near a site without requiring major infrastructure upgrades. The small size of SRPs and their siting flexibility made them a potentially feasible option for the SqCWD. In this Study, 25 potential recycled water users were evaluated based on estimated recycled water demand and available supply. Potential recycled water users having less than 20 afy of water demand were eliminated from the study based on cost-effectiveness, leaving two potential customers: (1) Polo Grounds Regional Park and Aptos Junior High (PGR Park/AJH) in Aptos; and (2) Seascape Golf Course (SGC) in Aptos.

The Study concluded that the PGR Park/AJH site was not feasible due to engineering limitations of the sewer system in this area. While the SGC has an adequate supply and meets the engineering requirements, the cost of water was approximately \$7,300 per acre foot. This is higher than the anticipated cost of water from a regional seawater desalination plant. Additionally, a SRP at this site would only save about 134 afy. Lastly, as SGC is currently irrigated with groundwater from a private well, any groundwater savings due to the SRP would not reduce the pumping demands of SqCWD. For these reasons, SqCWD has pursued the more cost-effective option of ocean desalination and will continue to evaluate the use of recycled water as regulations, treatment technologies and demand for recycled water changes.

*#45. (Describe) the wastewater collection and treatment systems in the supplier's service area, including a quantification of the amount of wastewater collected and treated and the methods of wastewater disposal (10633(a)).*

The Santa Cruz County Sanitation District, a special district operated through the Santa Cruz County Public Works Department, collects approximately 4.3 million gallons per day of wastewater generated within the SqCWD's service area at their Lode Street facility in Santa Cruz. The wastewater is then pumped over to the City of Santa Cruz's regional wastewater treatment plant at Neary Lagoon for treatment. The plant also receives wastewater from the City of Santa Cruz, the City of Scotts Valley, and other unincorporated areas of Santa Cruz County.

The treatment process consists of a series of steps, including screening, aerated grit removal, primary sedimentation, trickling filter treatment, solids contact, secondary clarification, and ultraviolet disinfection. Treated effluent is discharged to Monterey

Bay through a deep water outfall extending approximately 12,000 feet on the ocean bottom and terminating one mile offshore at a depth of approximately 110 feet below sea level (City of Santa Cruz Urban Water Management Plan, 2005).

As shown in **Table 4-6**, the plant treats a combined total of approximately 9-10 million gallons per day (gpd) to Disinfected Secondary-23 levels as defined under Title 22 of the CCR (D. Seidel, personal communication, February 15, 2011). Per Title 22, allowable uses for recycled water treated to this level include some surface irrigation (i.e., cemeteries, freeway landscaping, restricted access golf courses, ornamental nursery stock, sod farms, and pasture for livestock producing milk for human consumption). This water may not be used for irrigation of parks, school yards or playgrounds. Some specific industrial and cooling uses are also allowed where the recycled water is not sprayed and does not come into contact with workers.

<b>Table 4-6</b> <b>Recycled Water – Wastewater Collection and Treatment</b>				
<b>Type of Wastewater</b>	<b>Name of Treatment Plant</b>	<b>Treatment Level</b>	<b>Volume Treated in 2010 (million gallons per day)</b>	<b>Volume that Meets Recycled Water Standard (million gallons per day)<sup>a</sup></b>
<b>Wastewater collected and treated outside of service area</b>	City of Santa Cruz Regional Wastewater Treatment Plant	Disinfected Secondary-23	9-10	9-10  0.15 is currently reused on-site.
<b>Wastewater collected and treated in service area</b>	Los Barrancos	Undisinfected Secondary	0.0015	0.0015
	Sand Dollar Beach	Undisinfected Secondary	0.0062	0.0062
	Canon Del Sol	Undisinfected Secondary	0.0042	0.0042

Footnote:

<sup>a</sup>The allowed uses of recycled water vary depending upon the level of treatment. Undisinfected Secondary treatment allows the recycled water to be used for limited surface irrigation (e.g., no contact with edible portions of crops) and flushing sanitary sewers. Disinfected Secondary – 23 allows for more irrigation uses but does not allow for edible crop irrigation, or irrigation within schoolyards, playgrounds or parks. Additionally, irrigation use is limited to restricted access golf courses.

As also indicated in Table 4-6, there are three package wastewater treatment units operated by the Santa Cruz County Water and Wastewater Operations Division that are located within the SqCWD service area. These units treat small quantities of wastewater from the Los Barancos residential development in Aptos, and the Sand Dollar Beach and Canon del Sol residential developments in La Selva Beach. The

unit that serves Los Barancos treats about 1,500 gpd. The treatment units that serve Sand Dollar Beach and Canon del Sol treat approximately 6,200 gpd and 4,200 gpd, respectively. All three units treat wastewater to Undisinfected Secondary treatment levels and discharge effluent to leach fields (Amy Gross, personal communication, February 15, 2011). Per Title 22, allowed uses for wastewater treated to this Undisinfected Secondary levels include limited surface irrigation for vineyards and orchards (no contact with edible portion of crops), pasture for animals not producing milk for human consumption, seed crops (not for human consumption), ornamental nursery stock, sod farms and Christmas trees, and fodder and fiber crops. Additionally, this water may be used for flushing sanitary sewers.

Lastly, some wastewater generated from within the SqCWD service area is discharged to septic systems.

The projected volume of wastewater to be generated within the service area over the next 20-year period is unknown. Additionally, projected volumes of wastewater to be collected and treated at each of the treatment plants over the next 20 years is unknown.

*#46. (Describe) the quantity of treated wastewater that meets recycled water standards, is being discharged, and is otherwise available for use in a recycled water project (10633(b)).*

The majority of wastewater generated within the SqCWD service area is treated by the City of Santa Cruz's regional wastewater treatment plant, located outside of the SqCWD service area. Per Dan Seidel, Wastewater Treatment Plant Superintendent, the plant currently uses about 0.15 million gallons per day (55 million gallons per year) of recycled water to meet its major, on-site process water needs. Approximately 8.85-9.85 million gallons per day are discharged from the treatment plant (D. Seidel, personal communication, February 15, 2011). While this water is potentially available for reuse, the allowed uses are limited and evaluations conducted by the City of Santa Cruz concluded that use of this water was not currently feasible due to project opposition, limited yield and high cost.

*#47. (Describe) the recycled water currently being used in the supplier's service area, including, but not limited to, the type, place, and quantity of use (10633(c)).*

Recycled water is not currently being used within the SqCWD's service area.

*#48. (Describe and quantify) the potential uses of recycled water, including, but not limited to, agricultural irrigation, landscape irrigation, wildlife habitat enhancement, wetlands, industrial reuse, groundwater recharge, indirect potable reuse, and other appropriate uses, and a determination with regard to the technical and economic feasibility of serving those uses (10633(d)).*

As previously stated, recycled water is not currently used within the SqCWD service area. A study of the feasibility of using recycled water from satellite reclamation plants within the service area was completed in 2009. This study found that use of recycled water for irrigation was not currently cost-effective and was limited to one potential large irrigation user.

As the SqCWD service area does not have any agricultural or industrial customers, and there are limitations to using recycled water for groundwater recharge, the only current potential use of recycled water within the service area is for landscape irrigation. As discussed above in Checklist Item #44, there are significant technical and economic limitations to using recycled water for irrigation purposes within the SqCWD service area.

SqCWD will continue to evaluate new potential opportunities for using recycled water as they arise. However, at this time we do not project the use of recycled water over the planning horizon of this UWMP.

*#49. (Describe) the projected use of recycled water within the supplier's service area at the end of 5, 10, 15, and 20 years, and a description of the actual use of recycled water in comparison to uses previously projected pursuant to this subdivision (10633(e)).*

The SqCWD's current use of recycled water is zero and the projected use at the end of years 5, 10, 15 and 20 is zero.

In the 2005 UWMP, SqCWD indicated that two satellite reclamation plants (SRPs) were being evaluated for Anna Jean Cummings (AJC) Park in Soquel and the Seascape Golf Course (SGC) in Aptos. Preliminary estimates indicated a potential production of 45 afy for AJC Park, of which the Park could use about 22-44 afy, and a potential production of 400 afy for the SGC, which appeared to be within their estimated irrigation demand. (Note: The SGC is not a SqCWD water customer and their irrigation needs are served by a private, unmetered well.) The 2005 UWMP projected that use of recycled water at these sites could reduce potable water demand by up to 450 afy, and could be in operation within the next five or ten years.

In 2009, the SqCWD initiated a more detailed study (Black & Veatch, 2009) which evaluated a number of potential recycled water customers, including the AJC Park and the SGC. As discussed above in Required Element #44, this study identified two sites, the Polo Grounds Regional Park/Aptos Junior High School (PGR Park/AJH)

and the SGC, as having the most potential. However, the PGR Park/AJH was found to be infeasible due to engineering considerations, and the installation of a SRP at the SGC would only save about 134 afy at a cost of \$7,300 per af.

*#50. (Describe the) actions, including financial incentives, which may be taken to encourage the use of recycled water, and the projected results of these actions in terms of acre-feet of recycled water used per year (10633(f)).*

Currently, the use of recycled water within the District is cost-prohibitive and the amount of potable water saved (134 afy) is insufficient to justify the expense. Additionally, the cost of using recycled water would have to be spread among customers throughout the service area, while only benefiting one or two large landscape irrigators. For these reasons, the SqCWD is currently pursuing other options for a supplemental source of supply.

*#51. (Provide a) plan for optimizing the use of recycled water in the supplier's service area, including actions to facilitate the installation of dual distribution systems, to promote recirculating uses, to facilitate the increased use of treated wastewater that meets recycled water standards, and to overcome any obstacles to achieving that increased use (10633(g)).*

As a regional water recycling facility is not currently a viable option and SRPs are not currently cost effective, SqCWD does not have a plan to facilitate and encourage the use of recycled water within the service area for allowed/regulated uses. SqCWD will continue to evaluate the use of recycled water as regulations, treatment technologies and demand for recycled water changes.

SqCWD does require that all new construction include the use of recirculated water for cooling purposes and that all new automated car washes use recycled water. Additionally, water in decorative pools, ponds, fountains and other water features must be recirculated. SqCWD has researched the subject of requiring dual-plumbing for graywater for new development with both the City of Capitola and the County of Santa Cruz Planning Departments. Both agencies expressed interest in this at a future date, but feel implementation at this time is not feasible for both economic and technical reasons. SqCWD currently encourages the installation of dual-plumbing for graywater systems in new development through a voluntary Go Green Program. Developers are able to apply for a reduction in Water Demand Offset fees by voluntarily installing non-required water saving features.

***Required Elements — Future Water Projects***

*#30. (Describe) all water supply projects and water supply programs that may be undertaken by the urban water supplier to meet the total projected water use as established pursuant to subdivision (a) of Section 10635. The urban water supplier shall include a detailed description of expected future projects and programs, other than the demand management programs identified pursuant to paragraph (1) of subdivision (f), that the urban water supplier may implement to increase the amount of the water supply available to the urban water supplier in average, single-dry, and multiple-dry water years. The description shall identify specific projects and include a description of the increase in water supply that is expected to be available from each project. The description shall include an estimate with regard to the implementation timeline for each project or program (10631(h)).*

As previously discussed in Required Element #31, the SqCWD has been evaluating potential supplemental water supply sources for more than 20 years, most recently as part of the development of the IRP that was adopted in 2006. The IRP identifies seawater desalination as the best supplemental supply option for SqCWD. At this time, seawater desalination is the only project that SqCWD is actively pursuing to increase supplemental water supply.

As the City of Santa Cruz concurrently went through a similar process and also identified seawater desalination as their preferred option, the two agencies formed the **scwd**<sup>2</sup> Desalination Program to jointly evaluate and plan for a shared 2.5 million gallon per day (mgd) desalination project. The proposed project would reduce reliance on an overdrafted groundwater supply, protect against seawater intrusion, provide much needed water during droughts, and protect threatened and endangered species.

Under the Desalination Program Memorandum of Understanding (MOU), the City would operate the plant during drought conditions, with first priority given for the months May through October. The SqCWD would potentially operate the plant year-round during normal water years, and would have first priority in drought years during the months December through March. For the months of April and November, the first priority would be equally shared between SCWD and SqCWD. **Table 4-7** summarizes the amount of water that is anticipated to be used by SqCWD from the proposed desalination plant in average, single-dry, and multiple-dry water years.

<p style="text-align: center;"><b>Table 4-7</b> <b>Projected SqCWD Supply from Proposed Desalination Plant</b> <b>(acre-feet/ year)</b></p>					
	Normal year	Single-dry year	Multiple- dry year 1	Multiple- dry year 2	Multiple- dry year 3
<b>Production of Desalinated Water for SqCWD</b>	1,848 <sup>a</sup>	1,848 <sup>a,b</sup>	1,848 <sup>a,b</sup>	1,148 <sup>c</sup>	1,148 <sup>c</sup>

Footnote:

<sup>a</sup>Assumes SqCWD would use 66% of the capacity of the 2,800 acre-feet/year proposed plant.

<sup>b</sup>A single-dry year will be considered multiple-dry year 1 if it is followed by a second dry year (i.e., multiple-dry year 2).

<sup>c</sup>Assumes SqCWD would use 41% of the capacity of the 2,800 acre-feet/year proposed plant.

For current planning purposes, SqCWD would utilize the desalination plant with a two-fold approach to remediate the unsustainability of the Soquel-Aptos Groundwater Basin:

1. Restore protective groundwater levels by limiting groundwater pumping. This could take more than 10 years and the annual amounts would vary depending on desalination availability. Protective groundwater levels are the minimum needed to prevent seawater contamination as identified by the SqCWD's hydrologist.
2. Maintain protective groundwater levels for the long-term. Hydrologists predict that after the basin has recovered, groundwater pumping must be restricted by at least 500 acre-feet per year less than current use. Conservation alone will likely not save enough, and there will be an ongoing need to supplement our groundwater sources.

The **scwd**<sup>2</sup> has conducted extensive public outreach over the last two years to provide information on the local water supply conditions, past water supply planning studies, and many aspects of building and operating a desalination plant. On November 15, 2010 a Notice of Preparation/Initial Study was published for the desalination project, thereby launching a scoping comment period under the California Environmental Quality Act (CEQA). During the scoping period, the **scwd**<sup>2</sup> received comments from the public and other agencies regarding the potential environmental effects to be evaluated in the desalination project's draft Environmental Impact Report (EIR). A draft EIR is currently being prepared and is anticipated to be released in 2012. Upon release of the draft EIR, public meetings will be held and a public comment period will be established.

Comments received during the public comment period will be responded to in the final EIR which is scheduled to be completed in 2012. After completion of the EIR, the Santa Cruz City Council and the SqCWD Board of Directors will consider certification of the EIR and project approval. If the EIR is certified and the project is approved, construction of the desalination plant could begin in 2013. Based on this schedule, construction of the plant would be complete and the plant would be operational by 2016.

Project constraints include potential environmental impacts to marine life in regards to intake and brine disposal, public/voter opposition, failure to secure regulatory approval, siting of the plant, construction and operating costs, and issues associated with energy use and carbon footprint.

## **Section 5: Water Supply Reliability and Water Shortage Contingency Planning**

This section includes two main topics: water supply reliability and water shortage contingency planning. The supply reliability portion includes a general discussion of factors (i.e., climatic, environmental, water quality and legal) that could potentially limit the quantity of water available from Soquel Creek Water District's (SqCWD) current source of supply through 2030. The quantitative impacts to the water supply from potential climatic, environmental and water-quality issues and the possible methods for addressing these issues are discussed. The water supply reliability portion of this section also describes the management tools that SqCWD has implemented to maximize current resources, identify supplemental sources of supply, and minimize the need to import water from other regions.

This section also includes SqCWD's Water Shortage Contingency Plan (WSCP). The purpose of the WSCP is to conserve the available water supply and protect the integrity of the water supply, with particular regard for domestic water use, sanitation, and fire protection; and to protect and preserve public health, welfare, and safety. The potential types of water supply shortages are categorized into three groups as follows:

- Short-term supply shortages due to catastrophic emergencies;
- Long-term supply shortages due to prolonged drought, contamination, destruction of critical water supply facilities, etc.
- Supply shortages due to groundwater overdraft.

Catastrophic emergencies that cause short-term supply shortages may be natural or of man-made origin and include but are not limited to the following events: power outages, winter storms, earthquakes, structural failures, contamination and bomb threats. These types of emergencies may limit SqCWD's immediate ability to provide adequate water service to meet the requirements for human consumption, sanitation and fire protection. Such emergencies are usually limited in duration and, at the time of declaration, are not expected to last more than a few weeks.

Long-term supply shortages can be due to various factors, such as prolonged drought. For the drought scenario, this Urban Water Management Plan (UWMP) considers available supplies during single-dry and multiple-dry years. Conditions during these years are based on historical records of annual runoff for the watershed in which SqCWD obtains its groundwater supply. Other long-term supply shortage scenarios are included with the drought discussion because the water restriction stages, consumption reduction measures and prohibitions for each are similar.

Lastly, groundwater supply shortages due to overdraft affect many or all users of the groundwater basin, not just SqCWD customers. Overdraft is the result of ongoing pumping in excess of the recharge capabilities of the aquifer, i.e., in excess of the sustainable yield. The undesirable result of overdraft is a combination of chronically depressed coastal groundwater levels, reversed seaward gradients, and degraded groundwater quality. A groundwater emergency may be declared when it is demonstrated that a groundwater overdraft exceeding the sustainable yield threatens the public health, safety, and welfare of the community.

For the three types of water supply shortages (short-term, long-term, and groundwater overdraft), the following information is provided: (1) actions SqCWD will undertake to prepare for and implement during an interruption of water supply; (2) mandatory prohibitions against specific water use practices; (3) consumption reduction methods that would achieve a 50 percent reduction in water use in the most restrictive stages; (4) penalties or charges for excessive use; and (5) assessment of the impacts of prohibitions and restrictions on SqCWD revenues and the actions that may be taken to address these impacts.

Please note that there is significant overlap in regards to stages, target curtailment levels, mandatory prohibitions, and consumption reduction methods for each of the three types of shortages.

### **Water Supply Reliability**

#### ***Required Elements — Water Supply Reliability***

*Checklist Item #5. An urban water supplier shall describe in the plan water management tools and options used by that entity that will maximize resources and minimize the need to import water from other regions (10620(f)).*

The SqCWD actively manages groundwater resources in the Soquel-Aptos area using a combination of management tools that were first established in the 1996 Soquel-Aptos Area Groundwater Management Plan, which was updated and expanded in 2007. As a result of SqCWD's ongoing groundwater monitoring program, signs of coastal overdraft were detected early and the District adopted the current Integrated Resources Plan (IRP) in 2006. The goal of the IRP is to characterize the groundwater supply shortage, to evaluate and identify programs and methods to best protect and maximize existing resources, and to evaluate potential supplemental-supply options and identify those that merit further evaluation. The final IRP sets forth the following components for meeting this goal:

- **Demand Management:** continued implementation of existing and new conservation and drought management programs
- **Conjunctive Use Supply Project:** evaluation and potential development of a regional seawater desalination facility with the City of Santa Cruz

- **Local Supplemental Supply Alternatives:** if determined to be needed, preparation of project-level feasibility studies for a modified Soquel Creek diversion project and/or local-only desalination as alternatives, or in addition to, the regional desalination project; and development of site specific recycled water supplies for non-potable irrigation use
- **Groundwater Management:** continued monitoring/assessment of coastal groundwater quality and levels under the guidelines provided in the Groundwater Management Plan for the Soquel-Aptos Area (SqCWD and CWD, 2007); redistribute groundwater pumping as identified in the Well Master Plan to alleviate the potential for saltwater intrusion; and support recharge protection and enhancement projects and policies

The IRP supplemental supply components are to be implemented in phases to meet the growing shortages that could occur in the future, to respond to changes in water supply conditions as individual components are carried out, and to facilitate periodic updates to the IRP.

Since its adoption, SqCWD has sustained a focused effort to implement the IRP. A description of tasks accomplished under the IRP is included in Section 2. Continued implementation of the IRP components will maximize resources and minimize the need to import water from other regions, which is currently infeasible.

*Checklist Item #23. For any water source that may not be available at a consistent level of use, given specific legal, environmental, water quality, or climatic factors, describe plans to supplement or replace that source with alternative sources or water demand management measures, to the extent practicable (10631(c)(2)).*

In Table 4-2, SqCWD identifies “supplier-produced groundwater” as the current source of supply. Supplier-produced groundwater is the groundwater from two geologic formations (the Purisma Formation (Purisma) and the Aromas Red Sands (Aromas)) that underlie the SqCWD service area. As shown below in **Table 5-1**, consistent future use of both the Purisima and the Aromas may be affected by climatic (i.e., climate change) and environmental factors (i.e., groundwater overdraft and seawater intrusion). Additionally, consistent future use of the Aromas may be affected by water quality factors (i.e., hexavalent chromium). These factors are discussed below in greater detail.

<p style="text-align: center;"><b>Table 5-1</b>  <b>Factors Resulting in Inconsistency of Supply</b></p>					
<b>Water Supply Sources<sup>a</sup></b>	<b>Specific Source Name</b>	<b>Climatic</b>	<b>Legal</b>	<b>Environmental</b>	<b>Water Quality</b>
Supplier-Produced Groundwater (Current Source)	Purisima Formation	✓	Not expected to affect available supply	✓	Not expected to affect available supply
	Aromas Red Sands Aquifer	✓	Not expected to affect available supply	✓	✓
Desalination (Potential Future Source)	Regional with City of Santa Cruz	These factors are not expected to affect the consistency of supply that would be available from the proposed desalination plant. SqCWD would receive less water from the proposed desalination plant during times of drought. However, the total volume of water produced from the desalination plant would not be affected by drought.			

Footnote:

<sup>a</sup> From Table 4-2.

#### *Climatic Factors*

Consistent future use of the Aromas and Purisima groundwater sources may be affected by climate change. Climate change forecasts indicate an increase in the intensity of storms, potentially leading to higher runoff and less recharge of groundwater basins. Additionally, projected rises in sea level may increase the risk and extent of seawater intrusion. Potential impacts to SqCWD's groundwater supply from climate change are discussed in Section 7. Reductions in future groundwater supply due to impacts associated with climate change cannot be quantified at this time.

#### *Environmental Factors*

As discussed in Sections 2 and 4, the coastal aquifer underlying the Soquel-Aptos area is in a state of overdraft. Coastal groundwater levels are below elevations that protect the basin from seawater intrusion (HydroMetrics LLC, 2009a). This potential for seawater intrusion indicates that collective pumping by numerous public and private users has exceeded the sustainable groundwater yield of the Soquel-Aptos area over the long-term. In order to recover groundwater levels to protective elevations and eliminate overdraft, SqCWD must reduce pumping to levels below the sustainable yield (HydroMetrics WRI, 2011) and other pumpers must not further impact the overdrafted portion of the basin. The IRP and the 2007 Groundwater Management Plan update suggested the total sustainable yield for

Soquel Creek Water District was not more than 4,800 acre-feet per year (afy) (3,000 afy from the Purisima and 1,800 afy from the Aromas). Recent modeling and evaluations by Hydrometrics WRI (2011) indicate that the sustainable yield in the Purisima is approximately 2,500 afy and the sustainable yield in the Aromas could be just several hundred acre-feet, which is significantly less than the 1,800 afy previously projected. Additional modeling and evaluations are still underway to more fully characterize protective elevations and the sustainable yield within portions of the Aromas aquifer used by SqCWD.

#### *Water Quality Factors*

Consistent future use of the Aromas may also be affected by the presence of naturally-occurring hexavalent chromium as discussed in Section 2, and in the section below (Checklist Item #52) titled “Water Quality”.

#### *Legal Factors*

SqCWD does not anticipate any legal factors (i.e. adjudication) that would have an impact upon the future supply of groundwater from the Aromas or the Purisima.

#### *Response to Factors*

In response to the climatic, environmental and water quality factors mentioned above that could potentially impact the consistency of SqCWD’s existing groundwater supply in the future, SqCWD is advocating continued conservation and pursuing a supplemental supply from a proposed desalination plant. SqCWD does not anticipate any legal, environmental, water quality or climatic factors that would have a limiting effect on the amount of supply expected to be available to the SqCWD from the proposed desalination plant.

Additionally, SqCWD completed a Well Master Plan and will be developing up to five new wells to redistribute pumping inland to reduce the risk of seawater intrusion.

#### ***Required Elements — Water Quality***

*Checklist Item #52. The plan shall include information, to the extent practicable, relating to the quality of existing sources of water available to the supplier over the same five-year increments as described in subdivision (a) of Section 10631, and the manner in which water quality affects water management strategies and supply reliability (10634).*

#### **Current SqCWD Water Quality Issues**

The SqCWD annually publishes a Consumer Confidence/Water Quality Report that presents the results of test data from all the District’s groundwater wells in the Purisima and Aromas, plus any water purchased from Central Water District. In 2010, the SqCWD tested for 127 constituents to ensure the water meets State and Federal drinking water standards.

During the 2005-2010 reporting period for this UWMP, groundwater from SqCWD wells was within current primary Maximum Contaminant Levels (MCLs). The constituents with primary MCLs that have been detected in the past and are closely monitored include naturally occurring elevated metals (i.e. arsenic in the Purisima and chromium (total) in the Aromas) and nitrates. The source of arsenic and chromium in the groundwater is the erosion of natural deposits, whereas nitrates are primarily present due to runoff and leaching from fertilizer use and septic tanks. A few naturally occurring constituents exceed secondary drinking water standards (i.e., iron and manganese in the Purisima), and other naturally occurring constituents are closely monitored even though they are currently unregulated (i.e. hexavalent chromium or chromium-6).

Groundwater from 3 of 15 wells is currently treated to remove arsenic even though historic concentrations do not exceed the primary MCL for this constituent. Groundwater from 8 of 15 wells is currently treated to reduce iron and manganese concentrations to levels below secondary MCLs for these constituents. Groundwater treatment for all three of these constituents consists of oxidation and filtration.

#### **Future SqCWD Water Quality Issues**

Of the constituents discussed above, the one that may have the greatest impact on future supply reliability is the presence of naturally occurring chromium-6 in the Aromas. As discussed in Section 2, chromium-6 is currently regulated as total chromium which has a State MCL of 50 parts per billion (ppb) and a Federal MCL of 100 ppb. Since 2001 when SqCWD first began testing for chromium-6, it has been detected in six of the 15 active wells within SqCWD service areas 3 and 4. Measured levels within the six wells ranged from 0.42 ppb to 40 ppb, all below the current State and Federal MCLs for total chromium. However, the State set a Public Health Goal (PHG) of 0.02 ppb for chromium-6 on July 27, 2011. The adopted PHG will be used to develop a State MCL for chromium-6. As an MCL must be set at a level as close as is technically and economically feasible to a constituent's PHG, it is likely that SqCWD will have to conduct some level of chromium-6 treatment in the Aromas to continue using this source of water in the future. The U.S. Environmental Protection Agency (US EPA) is also developing a federal MCL for chromium-6, though the State MCL will likely be more stringent. Depending upon the MCL adopted by the State and the US EPA, future challenges for SqCWD include the availability of treatment technology that can remove chromium-6 to very low levels and the cost of the treatment technology.

A State MCL for chromium-6 could be in place by the 2015 or 2020 UWMP reporting period. As the MCL for chromium-6 has not been finalized, it is difficult to predict the volume of water that may be affected. However, it is possible that the majority of the water pumped from the Aromas (approximately one third of the District's total groundwater supply or an average of about 1,600 acre-feet per year) would require

treatment to remove chromium-6. When the treatment technology capable of meeting these low levels is developed, the cost of treatment will need to be evaluated in comparison to other potential sources of supply.

### **Water Shortage Contingency Plan**

As previously mentioned, SqCWD's Water Shortage Contingency Plan (WSCP) addresses three types of water supply shortages that could potentially impact SqCWD and its customers:

1. Short-term water supply shortages due to natural or man-made catastrophic emergencies;
2. Long-term supply shortages due to prolonged drought, contamination, destruction of critical water supply facilities, etc.; and
3. Supply shortages due to groundwater overdraft.

The provisions of the WSCP apply to all persons, customers, and property utilizing water provided by the SqCWD. The terms "person" and "customer" as used in the Plan include individuals, businesses, public agencies, corporations, partnerships, associations, and all other legal entities.

A draft model resolution establishing criteria to declare a water shortage emergency is included as **Appendix O**.

***Required Elements — Emergency Planning for Short-Term Water Shortages***  
*Checklist Item #37. Actions to be undertaken by the urban water supplier to prepare for, and implement during, a catastrophic interruption of water supplies including, but not limited to, a regional power outage, an earthquake, or other disaster (10632(c)).*

Short-term water supply shortages may have a natural or man-made origin and include but are not limited to the following events: failures in the water system that disrupt production and delivery capability, power outages, winter storms, earthquakes, structural failures, contamination (physical, biological, or radiological) and bomb threats. These types of emergencies may limit SqCWD's immediate ability to provide adequate water service to meet the requirements for human consumption, sanitation and fire protection. Such emergencies are usually limited in duration and, at the time of declaration, are not expected to last more than a few weeks. The actions SqCWD has taken to prepare for and respond to these types of emergencies are discussed below.

### **Actions to Prepare for Catastrophic Interruption of Water Supplies**

In accordance with Section 1433(b) of the Safe Drinking Water Act (SDWA) as amended by the Public Health Security and Bioterrorism Preparedness and Response Act of 2002, California Health and Safety Code (Section 116460, 116555 and 116750), and California Waterworks Standards (Section 64560), SqCWD has

prepared an Emergency Response Plan (ERP) to provide a standardized response and recovery protocol to prevent, minimize, and mitigate injury and damage resulting from emergencies or disasters of natural or man-made origin. The SqCWD ERP includes specific action plans (APs) that serve as a guide for responding to the following types of emergencies: power outages, winter storms, earthquakes, structural failures, contamination, bomb threats, and water supply emergencies. The ERP also describes how to respond to potential threats or actual terrorist scenarios identified in the SqCWD's vulnerability assessment, as well as additional emergency response situations.

The goals of the ERP are to:

- rapidly restore water service after an emergency
- ensure adequate water supply for fire suppression
- minimize water system damage
- minimize impact and loss to customers
- minimize negative impacts on public health and employee safety
- provide emergency public information concerning customer service

In general, the ERP includes the following:

- system specific information for quick reference
- identification of alternate water sources including interconnections with adjacent water providers and supply options for short-term outages
- an inventory of SqCWD-owned emergency equipment and supplies and a contact list of local vendors/contractors with such equipment and supplies
- the emergency response organization for the incident command structure including personnel assignments and duties
- notification procedures along with contact information for coordination with other agencies
- procedures and sample notices and press releases for communicating with the public for both water supply and water quality interruptions
- emergency response, recovery and termination steps
- emergency contact information for SqCWD employees and Board members
- names and contact information for pre-arranged on-call contractors
- a training, exercise and drill program for SqCWD employees

SqCWD has undertaken a significant program to maintain water service and mitigate system damage during catastrophic emergencies, such as natural disasters or regional power outages. Three such programs are noteworthy:

1. SqCWD has installed seven electrical generators at critical facilities, including headquarters, two wells and four booster pump stations, and has four portable generators (i.e. two trucks and two trailers) that can be moved to other sites as needed. The generators are inspected on a weekly basis for operational readiness. SqCWD maintains a supply of diesel fuel at District

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headquarters. The current equipment should be sufficient to keep the storage tanks full for gravity-fed water supply throughout the system during a regional power outage.

2. All 18 of SqCWD's water storage reservoirs (i.e., tanks) are ground-supported flat-bottom welded-steel. Each reservoir was designed in accordance with the American Water Works Association Standard Specifications in effect at the time of construction. Since the SqCWD is located in the highly active Seismic Zone 4, all storage tanks are designed to prevent sliding and uplift. To maintain maximum flexibility in the vertical and tangential directions, all SqCWD tanks are being retrofitted with flexible seismic couplings between the tank and piping. To date, 16 of the 18 have been retrofitted with flexible seismic couplings. Each fiscal year, the SqCWD plans to budget funds to continue the tank seismic retrofit program until all water tanks have been fitted with flexible couplings.
3. Radio transmissions are used both for emergency communication and to operate SqCWD's Supervisory Control and Data Acquisition (SCADA) system, which is critical for monitoring and operating the water system. The District has a spare antenna in the event the main antenna at headquarters is knocked down or damaged.

In the event of a catastrophe that may affect the SqCWD water system, the Water Utility Emergency Response Manager (WUERM) will be immediately notified to determine if an Action Plan(s) should be initiated. The WUERM will notify the General Manager and other members of the SqCWD's Standardized Emergency Management System (SEMS).

The General Manager or his/her designee is authorized and directed to implement the applicable provisions of the ERP upon determination that such implementation is immediately necessary to protect public health, safety, and welfare. The General Manager or his/her designee is also authorized to initiate or terminate short-term water supply emergency response measures as described in the ERP.

The General Manager or his/her designee will contact Board members upon making the determination that a water-supply emergency exists and advise them of the short-term emergency actions to be taken. The decision of the General Manager or his/her designee to initiate or terminate emergency response measures must be presented to the Board of Directors for ratification at the next properly noticed Board meeting.

The Emergency Response Coordinator (ERC) or appropriate personnel will notify the public by means of publication in a newspaper of general circulation, radio and television public service announcements, direct mail to each affected customer, signs posted in public places and any other method deemed necessary by the ERC. When a public hearing is to be conducted to consider water supply emergency response,

public display ads will be published in a newspaper of general circulation giving the nature of the water supply emergency, the actions being considered and the time, date and place of the hearing in addition to other legal requirements for noticing public hearings as specified in the California Government Code.

**Actions to Implement During Catastrophic Interruption of Water Supplies**

In the event of a short-term emergency situation resulting in reduced water production capacity and the need for quick response, the General Manager or his/her designee will monitor water supply and/or demand conditions on an appropriate time interval (e.g., daily basis, weekly, etc.) and determine when conditions warrant initiation or termination of each stage of the WSCP, that is, when the specified “triggers” are reached. The stages and triggers for short-term emergencies are shown in **Table 5-2**. The General Manager or his/her designee will determine which areas of the District will be affected depending on the location and severity of the water supply emergency. Each stage of the emergency may be rescinded upon the determination that all of the conditions identified as the triggering events have ceased to exist or a lower stage of emergency may be invoked in response to improved production capacity.

<b>Table 5-2 Water Shortage Stages and Triggering Mechanisms for Short-Term Emergencies</b>				
<b>Stage I 0-5%</b>	<b>Stage 2 5-15%</b>	<b>Stage 3 15-25%</b>	<b>Stage 4 Over 25-35%</b>	<b>Stage 5 35-50%</b>
<b>Total production capacity is 95-100% of “normal.”</b>	<b>Total production capacity is 85-95% of “normal.”</b>	<b>Total production capacity is 75-85% of “normal.”</b>	<b>Total production capacity is 65-75% of “normal.”</b>	<b>Total production capacity is 65% or less of “normal.”</b>

As previously mentioned, SqCWD has developed action plans (APs) to address each of the high-risk threat scenarios identified in the SqCWD’s vulnerability assessment. The APs for the scenarios most likely to impact the SqCWD’s water supply are as follows:

Possible Catastrophe:        Regional Power Outage

Summary of Actions:

- Assess – Contact PG&E for estimated down time and determine which equipment and facilities are affected. Contact fuel suppliers, critical care customers and large water users, if necessary.
- Isolate and Remediate – Set up generators and perform any system changes needed to reroute water supply to affected area(s). Notify affected customers

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of interrupted service if area cannot be served water during the power outage. As appropriate, issue “Boil Water”, “Do Not Drink” or “Do Not Use” orders and press releases. If the duration of the power outage is substantial and system modifications can not be made to reroute water supply from another SqCWD source, make arrangements for water to be supplied by an outside contractor. Confirm availability with contractors who can provide bulk water deliveries (Refer to Appendix B of the ERP for contractor emergency contact information).

- Monitor – Frequently check the status of the backup power supply (fuel and battery levels). If damage to equipment occurs, then seek mutual aid with local agencies and/or the Water/Wastewater Agency Response Network (WARN).
- Recovery – Conduct disinfection, flushing, and sampling if necessary. Notify users when it is safe to drink water again.

Possible Catastrophe:        Earthquake

Summary of Actions:

- Assess – In general, earthquakes occur without any advance warning, which makes it difficult to take proactive measures. After an earthquake occurs, personnel should inspect all structures and facilities for damage. If power supply and SCADA are working, review system status. However, significant power outages can occur with earthquakes and power can be interrupted for extended periods of time.
- Isolate and Remediate – If a tank has been damaged, immediately zone off the facility to reduce flooding and notify nearby residents. Also, zone off sections of mains and/or fire hydrants that may have been broken. Notify affected customers that water service is disrupted. As appropriate, issue “Boil Water”, “Do Not Drink” or “Do Not Use” orders and press releases. If possible, perform system modifications to serve affected customers from another SqCWD source, or make arrangements for water to be supplied by an outside contractor. Confirm availability with contractors who can provide bulk water deliveries and contractors who can help with emergency repairs (Refer to Appendix B of the ERP for contractor emergency contact information).
- Monitor – Continue to monitor water system after an earthquake occurs. Aftershocks and resettlement may cause additional damage that needs to be addressed.
- Recovery – Inspect all facilities for structural damage and prioritize repair schedule. Respond to side effects that may include loss of power, chemical spills, etc. Conduct necessary procedures to bring the system back on line. Notify users when it is safe to drink water again.

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Possible Catastrophe: Flood

Summary of Actions:

- Assess – In general, flooding occurs with reasonable lead times. If a Flood Watch or Flood Warning is received, contact the local representative of the National Weather Service (NWS) for the exact location and probable extent of flooding relative to District facilities. If flooding has already occurred, conduct site assessments and determine which equipment and/or facilities have been affected.
- Isolate and Remediate – Assemble essential personnel to assist with flood proofing duties such as elevating electrical components, sandbagging, and staging stand-by generators and water pumps. If applicable, notify affected customers that water service is disrupted. If the duration of the water service disruption is substantial and system modifications cannot be made to reroute water supply from another SqCWD source, make arrangements for water to be supplied by an outside contractor. Confirm availability with contractors who can provide bulk water deliveries and contractors who can help with emergency repairs (Refer to Appendix B of the ERP for contractor emergency contact information).
- Monitor – Observe damage that may occur and look for fire hazards. (Fire is the most frequent hazard following floods.)
- Recovery – Determine condition of the facilities and equipment in the affected areas. Schedule and prioritize any repairs that are needed. Arrange for alternate source of power or water, if necessary.

Possible Catastrophe: Winter Storm

Summary of Actions:

- Assess – Winter Storms are often accompanied by strong winds and heavy rains which result in localized power and phone outages and road closures. Storms can also escalate into larger events that may affect the water system with cold-weather main breaks and disruption of service.
- Isolate and Remediate – Prior to the storm, ensure that personnel has performed “winterizing” tasks which can include maintaining backup generators, weatherproofing windows/doors at offsite buildings, insulating necessary exterior piping/appurtenances, and testing backup communication systems. During the storm, notify customers if service is disrupted and make system modifications to provide water to affected areas and isolate mains that may break from freezing conditions. If the duration of the water service disruption is substantial and system modifications cannot be made to reroute water supply from another SqCWD source, make arrangements for water to be supplied by an outside contractor. Confirm availability with contractors who can provide bulk water deliveries and contractors who can help with emergency repairs (Refer to Appendix B of the ERP for contractor emergency contact information).

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- Monitor – Observe tank levels and backup power (if required). Test water quality and follow appropriate procedures if water quality emergencies arise.
- Recovery – Determine condition of the facilities and equipment of the affected areas. Schedule and prioritize repairs that are needed. Arrange for alternate source of power or water, if necessary.

*Checklist Item #38. Additional, mandatory prohibitions against specific water use practices during water shortages, including, but not limited to, prohibiting the use of potable water for street cleaning (10632(d)).*

The SqCWD Water Waste Prohibition Ordinance (No. 10-03) is in effect at all times regardless of whether any declared shortage condition is in effect. Due to the variability in the causes, severity and anticipated duration of potential short-term emergencies, it is difficult to identify the specific mandatory prohibitions to be implemented in each case. Each short-term emergency will be evaluated on a case-by-case basis to determine which rationing stages and mandatory prohibitions will apply. However, SqCWD will use the rationing stages and mandatory prohibitions established for drought and other long-term emergencies as a reference point. These stages and prohibitions are identified in **Tables 5-6, 5-7 and 5-9**.

*Checklist Item #39. Consumption reduction methods in the most restrictive stages. Each urban water supplier may use any type of consumption reduction methods in its water shortage contingency analysis that would reduce water use, are appropriate for its area, and have the ability to achieve a water use reduction consistent with up to a 50 percent reduction in water supply (10632(e)).*

The consumption reduction methods that will be implemented during a short-term water supply emergency also will be determined on a case-by-case basis depending upon the severity and anticipated duration of the emergency and resulting shortage. The consumption reduction methods identified for drought and other long-term emergencies in **Tables 5-8 and 5-9** will be implemented for short term emergencies as appropriate.

*Checklist Item #40. Penalties or charges for excessive use, where applicable (10632(f)).*

The SqCWD's tiered rate billing structure discourages excessive water consumption at all times. The SqCWD is not likely to implement penalties or charges for excessive use during short-term water shortages because they are limited in duration and, at the time of declaration, are not expected to last more than a few weeks. If a short-term water supply shortage developed into a long-term shortage, then SqCWD would, depending on the level and anticipated duration of the shortage, consider a water allocation program.

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The SqCWD also has the ability to establish restrictions or discontinue service in the case of repeat offenders under the Water Code of the State of California.

*Checklist Item #41. An analysis of the impacts of each of the actions and conditions described in subdivisions (a) to (f), inclusive, on the revenues and expenditures of the urban water supplier, and proposed measures to overcome those impacts, such as the development of reserves and rate adjustments (10632(g)).*

The SqCWD has conducted a financial analysis of the impacts of the actions and conditions associated with water supply shortages. The analysis was conducted with a focus on long-term supply shortages due to prolonged drought, emergencies and groundwater overdraft. It is not expected that short-term water supply shortages would significantly impact SqCWD revenues and expenditures because they are limited in duration.

The analysis reveals that SqCWD has sufficient funds in the Capital Improvement Fund and Operating Contingency Reserve (OCR) Fund to mitigate the monetary shortfall for Stages 1 through 5. **Table 5-3** is an analysis of the financial impacts due to various Stages (1 – 5) of water shortages. The various water sales reductions associated with the five stages are: Stage 1 – 5%, Stage 2 – 15%, Stage 3 – 25%, Stage 4 – 35%, and Stage 5 – 50%.

To mitigate the financial impacts of a water shortage, the SqCWD would reduce projects from its Capital Improvement Fund and, if needed, use money from the OCR Fund. This process is used to stabilize rates during periods of reduced water sales due to a catastrophic interruption of water supply. The analysis reveals that SqCWD has sufficient funds in the Capital Improvement Fund and OCR Fund to mitigate the monetary shortfall for Stages 1 through 5. SqCWD may consider raising rates or assigning penalty fees for overuse if it appears that a Stage 3, 4 or 5 shortage may be of significant duration. However, future water rate increases and penalty fees for overuse may be subject to the requirements of California Proposition 218 (Prop 218). Prop 218 amended the California Constitution which requires government agencies to have a vote of affected property owners before any proposed new or increased fees can be assessed. The District may provide for the possibility of such fees and penalties as contingent provisions of a future rate adjustment.

The financial analysis accounts for less water sales and associated reductions in costs, such as less power consumption. In Stages 3 through 5, the cost for four additional staff needed to achieve desired reductions is budgeted.

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<b>Table 5-3</b> <b>Financial Impacts of Water Supply Shortages</b>						
	<b>Normal Yr.</b>	<b>Stage 1</b>	<b>Stage 2</b>	<b>Stage 3</b>	<b>Stage 4</b>	<b>Stage 5</b>
<b>DESCRIPTION</b>	<b>2011-12</b>	<b>5%</b>	<b>15%</b>	<b>25%</b>	<b>35%</b>	<b>50%</b>
<b>REVENUES</b>						
<i>Water Sales (a)</i>	<i>\$8,138,600</i>	<i>\$7,731,700</i>	<i>\$6,917,800</i>	<i>\$6,104,000</i>	<i>\$5,290,100</i>	<i>\$4,069,300</i>
Service Charges	\$3,352,300	\$3,352,300	\$3,352,300	\$3,352,300	\$3,352,300	\$3,352,300
Water Capacity Charges	\$75,000	\$75,000	\$75,000	-	-	-
Other Operating	\$859,100	\$859,100	\$859,100	\$859,100	\$859,100	\$859,100
Installation Fees	\$50,000	\$50,000	-	-	-	-
Interest Income	\$35,000	\$35,000	\$35,000	\$35,000	\$35,000	\$35,000
Other Non Operating	\$26,800	\$26,800	\$26,800	\$26,800	\$26,800	\$26,800
<b>TOTAL REVENUES</b>	<b>\$12,536,800</b>	<b>\$12,129,900</b>	<b>\$11,266,000</b>	<b>\$10,377,200</b>	<b>\$9,563,300</b>	<b>\$8,342,500</b>
<b>EXPENDITURES</b>						
Personnel service (wages)	\$2,932,500	\$2,932,500	\$2,932,500	\$3,092,500	\$3,092,500	\$3,092,500
Personnel expense (benefits)	\$1,396,000	\$1,396,000	\$1,396,000	\$1,468,000	\$1,468,000	\$1,468,000
Non Operating expense (debt service)	\$1,325,800	\$1,325,800	\$1,325,800	\$1,325,800	\$1,325,800	\$1,325,800
Supplies	\$1,005,700	\$1,005,700	\$1,005,700	\$1,005,700	\$1,005,700	\$1,005,700
Services	\$689,300	\$689,300	\$689,300	\$689,300	\$689,300	\$689,300
<i>Power (a)</i>	<i>\$566,000</i>	<i>\$537,700</i>	<i>\$481,100</i>	<i>\$424,500</i>	<i>\$367,900</i>	<i>\$283,000</i>
Post Retiree Benefits	\$411,900	\$411,900	\$411,900	\$411,900	\$411,900	\$411,900
Community Info & Conservation	\$268,700	\$268,700	\$268,700	\$295,600	\$322,400	\$349,300
Insurance	\$155,800	\$155,800	\$155,800	\$155,800	\$155,800	\$155,800
Outside Services (Misc & Engineering)	\$102,000	\$102,000	\$102,000	\$102,000	\$102,000	\$102,000
Network Systems Administrator	\$100,000	\$100,000	\$100,000	\$100,000	\$100,000	\$100,000
Water Treatment (labs)	\$97,500	\$97,500	\$97,500	\$97,500	\$97,500	\$97,500
Litigation	\$79,000	\$79,000	\$79,000	\$79,000	\$79,000	\$79,000
Bills/Envelopes	\$58,000	\$58,000	\$58,000	\$58,000	\$58,000	\$58,000
Paving/Backfill	\$51,000	\$51,000	\$51,000	\$51,000	\$51,000	\$51,000
Postage	\$50,900	\$50,900	\$50,900	\$50,900	\$50,900	\$50,900
Gasoline	\$50,000	\$50,000	\$50,000	\$50,000	\$50,000	\$50,000
<i>Hypochlorite (a)</i>	<i>\$38,000</i>	<i>\$36,100</i>	<i>\$32,300</i>	<i>\$28,500</i>	<i>\$24,700</i>	<i>\$19,000</i>
Fleet Maintenance	\$36,500	\$36,500	\$36,500	\$36,500	\$36,500	\$36,500
Uncollectible accounts	\$30,000	\$30,000	\$30,000	\$30,000	\$30,000	\$30,000
Annual audit	\$30,000	\$30,000	\$30,000	\$30,000	\$30,000	\$30,000
Property taxes/sewer assessment	\$15,000	\$15,000	\$15,000	\$15,000	\$15,000	\$15,000
<b>TOTAL EXPENDITURES</b>	<b>\$9,489,600</b>	<b>\$9,459,400</b>	<b>\$9,399,000</b>	<b>\$9,597,500</b>	<b>\$9,563,900</b>	<b>\$9,500,200</b>

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Table 5-3, <i>Continued</i> Financial Impacts of Water Supply Shortages						
	Normal Yr.	Stage 1	Stage 2	Stage 3	Stage 4	Stage 5
DESCRIPTION	2011-12	5%	15%	25%	35%	50%
REVENUES > EXPENDITURES	\$3,047,200	\$2,670,500	\$1,867,000	\$779,700	\$(600)	\$(1,157,700)
LESS: CAPITAL IMPROVEMENTS(b)	\$12,415,200	\$12,415,200	\$12,052,000	\$10,964,700	\$10,184,400	\$9,027,300
SURPLUS (DEFICIT)	\$(9,368,000)	\$(9,744,700)	\$(10,185,000)	\$(10,185,000)	\$(10,185,000)	\$(10,185,000)
BEGINNING RESERVE	\$14,990,000	\$14,990,000	\$14,990,000	\$14,990,000	\$14,990,000	\$14,990,000
ENDING RESERVE (c)	\$5,622,000	\$5,245,300	\$4,805,000	\$4,805,000	\$4,805,000	\$4,805,000

Footnotes:

(a) Amount reduced by the percentage indicated in each Stage level.

(b) Capital Improvement Projects reduced to maintain \$4,805,000 Reserve level (\$3,805,000 restricted to Certificate of Participation projects in 2012-13 and \$1 million in a Rate Stabilization Reserve to maintain debt coverage ratio).

(c) Reserve reduced to fund deficit; see footnote (b) for clarification of Ending Reserve levels.

*Checklist Item #42. A draft water shortage contingency resolution or ordinance (10632(h)).*

A draft model resolution establishing criteria to declare a water shortage emergency is included as **Appendix O**.

***Required Elements - Emergency Planning for Long-Term Water Shortages***

Long-term water supply shortages can result from prolonged drought, contamination, or emergencies that destroy critical water supply facilities, or other situations that jeopardize the District's ability to meet normal demand for human consumption, sanitation and fire protection for the foreseeable future. Since there is generally time to prepare for such issues, declaration of a long-term water-shortage emergency involves Board participation and approval.

The Board of Directors shall make the determination of the need to declare long-term water shortage emergencies and authorize implementation of the applicable provisions of the WSCP as necessary to protect public health, safety, and welfare. Prior to implementing mandatory measures in response to a long-term emergency, the Board of Directors shall conduct a public hearing on the proposed measures to be taken to reduce demand prior to imposing such measures.

When declared, it is anticipated that a considerable period of time will pass until normal supply production can be resumed (e.g. groundwater levels reach acceptable recovery after drought, contamination is removed, or lost water supply facilities are replaced).

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*Checklist Item #22. Describe the reliability of the water supply and vulnerability to seasonal or climatic shortage, to the extent practicable, and provide data for each of the following: (A) an average water year, (B) a single dry water year, (C) multiple dry water years (10631(c)(1)).*

Although the groundwater in the Soquel-Aptos area is in overdraft, the SqCWD has not experienced a water supply shortage on a short-term regular annual, monthly, or peak period basis due to drought periods. **Table 5-4** indicates the water years that represent an average rainfall year (1984), single driest year (1990), and multiple-dry water years (1987 - 1990) for the Soquel-Aptos area.

<b>Table 5-4</b> <b>Basis of Water Year Data</b>	
<b>Water Year Type</b>	<b>Base Year(s)</b>
Average Water Year	1984
Single-Dry Water Year	1990
Multiple-Dry Water Years	1987 - 1990

**Table 5-5** shows that 100 percent of the groundwater supply would be available during these dry years relative to a normal rainfall year. This is due to the capacity of the groundwater aquifers to withstand a relatively short-term drought.

<b>Table 5-5</b> <b>Supply Reliability – Historic Conditions</b> <b>(acre-feet/year)</b>					
<b>Average/ Normal Year</b>	<b>Single Dry Year</b>	<b>Multiple Dry Water Years</b>			
		<b>Year 1</b>	<b>Year 2</b>	<b>Year 3</b>	<b>Year 4</b>
4,610 <sup>a</sup>	4,610 <sup>a</sup>	4,610 <sup>a</sup>	4,610 <sup>a</sup>	4,610 <sup>a</sup>	4,610 <sup>a</sup>
Percent of Average/Normal Year:				100%	100%

Footnote:

<sup>a</sup> The 4,610 acre-feet/year value represents the average of the following two production periods: the 5-year production period from 2004-2008, and the 2-year production period of 2009-2010. See Section 4 for additional description of the methodology used to calculate the baseline 4,610 afy value.

Although SqCWD has not experienced short-term supply impacts from multi-year periods of low rainfall, modeling was recently performed to estimate the long-term impacts of drought on groundwater recharge rates. The SqCWD contracted with its hydrologic consultant, HydroMetrics WRI, to perform modeling to provide input for designing a drought curtailment policy. HydroMetrics WRI (2011) developed a model that can be used to estimate the relationship between rainfall and deep groundwater recharge in the Soquel-Aptos area. The model uses the Precipitation-Runoff Modeling System (PRMS) model, which is an established model code from the U.S. Geological Survey.

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The modeling results indicate that the effects of prolonged drought have a significant effect on recharge rates. For example, a median water year like 1984 was modeled to have contributed 5,932 acre-feet of deep recharge and a single-dry year like 1990 was estimated to contribute approximately 767 acre-feet of deep recharge. Thus, SqCWD has devised, as part of this WSCP, an approach to lessen the long-term impacts of prolonged drought and to capitalize on drought awareness to help save water.

*Checklist Item #35. Stages of action to be undertaken by the urban water supplier in response to water supply shortages, including up to a 50 percent reduction in water supply, and an outline of specific water supply conditions which are applicable to each stage (10632(a)).*

The modeling effort described above, in conjunction with input from District staff and the Board, resulted in the long-term water shortage stages shown in **Table 5-6**.

<b>Table 5-6</b> <b>Water Shortage Contingency</b> <b>Rationing Stages to Address Water Supply Shortages</b>		
Stage No.	Water Supply Conditions	% Shortage
1	Water shortage alert - voluntary curtailment	0-5%
2	Water shortage warning - mandatory curtailment	5-15%
3	Emergency water shortage - mandatory curtailment	15-25%
4	Severe water shortage - mandatory curtailment	25-35%
5	Critical water shortage - mandatory curtailment	35-50%

**Table 5-7** provides some of the mandatory prohibitions that are in effect during different water shortage stages.

<b>Table 5-7</b> <b>Water Shortage Contingency – Mandatory Prohibitions</b>	
Examples of Prohibitions	Stage When Prohibition Becomes Mandatory
Leaks	Always in effect
Exterior washing	Stage 2
Flushing of mains	Stage 2
Filling of ornamental fountains	Stage 3
Turf irrigation	Stage 4
Filling of nonpublic pools and hot tubs	Stage 4
Filling of public pools and hot tubs	Stage 5
All outdoor irrigation	Stage 5
<i>See <b>Table 5-9</b> for additional examples.</i>	

**Table 5-8** indicates some of the consumption reduction methods for the stages of a long-term water shortage.

<b>Table 5-8 Water Shortage Contingency – Consumption Reduction Methods</b>		
<b>Consumption Reduction Methods</b>	<b>Stage When Method Takes Effect</b>	<b>Projected Reduction (%)</b>
Voluntary actions	Stage 1	5% +
Enhanced outreach	Stage 2	5-10%
Increase water waste patrol	Stage 2	up to 5%
Landscape water budgets	Stage 3	5%+
Residential/commercial water rationing	Stage 3/4/5	20%+
<i>See <b>Table 5-9</b> for additional examples.</i>		

**Table 5-9** summarizes the WSCP for long-term water supply shortages due to prolonged drought. The WSCP is triggered based on rainfall amounts, and in the later stages (4 and 5), also takes aquifer water levels into consideration. For long-term shortages that are not caused by drought, the stages, curtailment targets, SqCWD actions and customer demand reduction measures remain the same; however, the trigger conditions are based on production (i.e., as a percentage of normal production) as opposed to rainfall.

As shown in **Table 5-9**, there are five curtailment stages for long-term supply shortages with target cutback levels ranging from 5% to 50%. The trigger levels shown for each curtailment stage are based on cumulative rainfall amounts (ending in March of the current year); however the stages and curtailments could be related to any long-term shortage cause (e.g., water-quality issues, etc.). Note also that the SqCWD Board may call for Stage 2 curtailment, even if the rainfall values criteria in Table 5-9 are exceeded, if the City of Santa Cruz announces Stage 2 curtailment. The concept is that since the groundwater basin already is in overdraft, SqCWD should capitalize on the momentum from the City of Santa Cruz. The customer demand reduction measures and key SqCWD actions for long-term water supply shortages identified in Table 5-9 are meant to serve as a guide and may be modified due to specific conditions.

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**Table 5-9**  
**Summary of Demand Reduction Actions and Measures**

<b>Shortage Stage and Curtailment Target</b>	<b>Trigger Conditions<sup>a</sup></b>	<b>Key District Communication and Operating Actions</b>	<b>Customer Demand Reduction Measures</b>
<b>Stage 1:</b> Water Shortage Alert  <b>Curtailment Target 5%</b>	Rainfall total as of March 31: < than median (26.2 inches) for current year	<ul style="list-style-type: none"> <li>• Undertake public information and advertising campaign</li> <li>• Promote rebates</li> <li>• Publicize water waste prohibitions and suggestions to reduce water use</li> <li>• Coordinate conservation with other agencies</li> </ul>	<ul style="list-style-type: none"> <li>• Voluntary water conservation requested of all customers</li> <li>• Enforce water waste ordinance</li> </ul>
<b>Stage 2:</b> Water Shortage Warning  <b>Curtailment Target 15%</b>	Stage 1 PLUS Rainfall total as of March 31: <= 50 in. over two yrs; or <= 80 in. over three yrs; or <= 109 in. over four yrs; or <= 137 in. over five yrs	<ul style="list-style-type: none"> <li>• Intensify public information campaign</li> <li>• Send direct notices to all customers</li> <li>• Contact landscape managers to inform them of the situation and heightened enforcement</li> <li>• Contact large users (mail/phone/email)</li> <li>• Optimize water sources; intensify system leak detection and repair; suspend flushing (except as necessary for health &amp; safety)</li> <li>• Increase water waste patrol and customers site visits</li> </ul>	<ul style="list-style-type: none"> <li>• Stage 1 measures +</li> <li>• Work with large landscapes on adhering to ordinances</li> <li>• Prohibit exterior washing of structures (only for surfaces for sanitation and health purposes)</li> <li>• Increase leak violation enforcement</li> </ul>
<b>Stage 3:</b> Emergency Water Shortage  <b>Curtailment Target 25%</b>	Stage 1 PLUS Rainfall total as of March 31: <= 68 in. over three yrs; or <= 97 in. over four yrs; or <= 129 in. over five yrs	<ul style="list-style-type: none"> <li>• Expand, intensify public information campaign</li> <li>• Establish conservation hotline</li> <li>• Provide regular media briefings; publish weekly consumption reports</li> <li>• Prepare to modify utility billing system and bill format to accommodate residential rationing, penalty rates – starting in Stage 3 or 4</li> <li>• Hire additional temporary staff in customer service, conservation</li> <li>• Give advance notice of possible moratorium on new connections if shortage continues</li> <li>• Contact surrounding water providers about purchasing water</li> <li>• Work with large users to reduce consumption</li> <li>• Work with other water providers and users of the basin to help reduce consumption</li> <li>• Stop irrigation on District owned property</li> <li>• Increase rebate promotion</li> <li>• Enhance usage monitoring</li> </ul>	<ul style="list-style-type: none"> <li>• Stage 1 &amp; 2 measures +</li> <li>• Work with large landscapes on water budgets</li> <li>• Institute water rationing for residential customers if necessary</li> <li>• Require commercial customers to display “save water” signage and develop conservation plans</li> <li>• Increase leak detection and repair</li> <li>• Prohibit water use for aesthetic purposes (i.e., for ornamental fountains, ponds, etc.) except where necessary to support life</li> <li>• Prohibit restaurants from serving water except upon patron request</li> <li>• No vehicle washing, except at sites that recycle 80% or more of water used</li> </ul>

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<b>Table 5-9 (Continued)</b> <b>Summary of Demand Reduction Actions and Measures</b>			
<b>Shortage Stage and Curtailment Target</b>	<b>Trigger Conditions<sup>a</sup></b>	<b>Key District Communication and Operating Actions</b>	<b>Customer Demand Reduction Measures</b>
<b>Stage 4:</b> Severe Water Shortage Emergency  <b>Curtailment Target 35%</b>	Rainfall total as of March 31: <= 80 in. over four yrs; or <= 107 in. over five yrs; or Stage 2/3 AND water levels are dropping	<ul style="list-style-type: none"> <li>Contract with outreach consultant to carry out major publicity campaign</li> <li>Continue to provide regular media briefings</li> <li>Open centralized drought information center</li> <li>Promote increase in graywater use to save landscaping</li> <li>Scale up appeals staff and frequency of hearings as needed</li> <li>Expand water waste enforcement to 24/7</li> <li>Develop strategy to mitigate revenue losses and plan for continuing/escalating shortage</li> <li>No new, additional, or expanded water service, except for health and safety issues</li> </ul>	<ul style="list-style-type: none"> <li>Stage 1, 2 &amp; 3 measures +</li> <li>Implement or reduce residential water allocations</li> <li>Institute water rationing for commercial and institutions (residential also if not already done)</li> <li>Minimal water budgets for large landscapes</li> <li>Prohibit turf irrigation</li> <li>Rescind hydrant and bulk water permits</li> <li>No filling of nonpublic pools/hot tubs</li> <li>No grace period for waste violations</li> </ul>
<b>Stage 5:</b> Critical Water Shortage Emergency  <b>Curtailment Target 50%</b>	Water levels are significantly dropping	<ul style="list-style-type: none"> <li>Continue all previous actions</li> <li>Implement crisis communications plan and campaign</li> <li>Activate emergency notification lists</li> <li>Coordinate with CA Department of Public Health regarding water quality and public health issues and with law enforcement and other emergency response agencies to address enforcement challenges</li> <li>Continue water waste enforcement 24/7</li> <li>Flow restrict accounts exceeding ration/allocation</li> </ul>	<ul style="list-style-type: none"> <li>Stages 1-4 measures +</li> <li>Further reduce residential water allocations</li> <li>Reduce commercial water allocations</li> <li>Prohibit all outdoor irrigation</li> <li>No water for recreational purposes, including filling public pools/hot tubs</li> <li>Continue all measures initiated in prior stages as appropriate</li> <li>Lock off all dedicated irrigation accounts</li> </ul>

Footnote:

<sup>a</sup> Rainfall is measured at the California Irrigation Management Information System (CIMIS) Station No. 104 (De Laveaga, Santa Cruz, CA).

The probabilities of the five drought stages shown in Table 5-9 are as follows (derived from HydroMetrics, WRI, 2011):

- ✓ Stage 1 – 50% of the time.
- ✓ Stage 2 – 19% of the time.
- ✓ Stage 3 – 13% of the time.
- ✓ Stage 4 – 3% of the time.
- ✓ Stage 5 – unlikely, very low probability.

**Penalties for Excessive Use**

SqCWD's three-tiered rate structure discourages excessive water consumption at all times. Depending on the severity and anticipated duration of the shortage, SqCWD may institute an allocation program if necessary. SqCWD has the ability to establish restrictions or discontinue service in the case of repeat offenders under the Water Code of the State of California.

*Checklist Item #36. An estimate of the minimum water supply available during each of the next three water years based on the driest three-year historic sequence for the agency's water supply (10632(b)).*

An estimate of the minimum water supply available during each of the next three water years based on the driest three-year historic sequence for the Soquel-Aptos area is shown below in **Table 5-10**. As the amount of water stored in the aquifers is relatively large compared to a multiple-year rainfall shortage, an evaluation indicates that SqCWD should be able to meet its water supply needs on a short-term basis. Additionally, SqCWD would implement proactive curtailment actions as noted, which should lower the demand.

<b>Table 5-10</b> <b>Supply Reliability – Current Water Sources</b> <b>(acre-feet/year)</b>				
<b>Water Supply Source</b>	<b>Average/Normal Water Year Supply</b>	<b>Multiple Dry Water Year Supply</b>		
		<b>Year 2011</b>	<b>Year 2012</b>	<b>Year 2013</b>
Groundwater	4,610 <sup>a</sup>	4,610 <sup>a</sup>	4,610 <sup>a</sup>	4,610 <sup>a</sup>

Footnote:

<sup>a</sup> See Table 5-5 footnote or Section 4 to see how this baseline value was calculated.

*Checklist Item #43. A mechanism for determining actual reductions in water use pursuant to the urban water shortage contingency analysis 10632(i).*

The water savings from implementation of the WSCP will be determined based on measurements of consumption from water meters and well production meters. Although all meters will be read at least bimonthly, some of the larger accounts may be read on a more frequent basis. At first, the cumulative consumption for the various sectors (e.g., residential, commercial, etc.) will be evaluated for reaching the target level. Then if needed, individual accounts will be monitored. Weather and other possible influences may be accounted for in the evaluation.

*Checklist Item #53. Every urban water supplier shall include, as part of its urban water management plan, an assessment of the reliability of its water service to its customers during normal, dry, and multiple dry water years. This water supply and*

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*demand assessment shall compare the total water supply sources available to the water supplier with the total projected water use over the next 20 years, in five-year increments, for a normal water year, a single dry water year, and multiple dry water years. The water service reliability assessment shall be based upon the information compiled pursuant to Section 10631, including available data from state, regional, or local agency population projections within the service area of the urban water supplier (10635(a)).*

**Tables 5-11, 5-12, and 5-13** indicate the forecasted available water supplies over the next 20 years during normal, dry, and multiple dry years. The forecasts do not show any predicted water shortfalls over the 20-year timeframe, even during a multi-year drought. However, this forecast is predicated on a supplemental supply being available, such as the proposed desalination plant. Without a supplemental water supply, the SqCWD would be short water over the 20-year horizon, even in a normal year. The shortage amounts (if no supplemental water is available) and percentages can be approximated as the amounts shown as “desalinated water” in **Tables 5-11 and 5-12**. As footnoted in **Table 5-13**, during a multi-year drought, even with a supplemental supply, some of the demand would be reduced due to the curtailment actions outlined in Table 5-9.

<b>Table 5-11</b> <b>Supply and Demand Comparison – Normal Year</b> <b>(acre-feet/year)</b>				
	<b>2015</b>	<b>2020</b>	<b>2025</b>	<b>2030</b>
Supplier-produced groundwater	4,448	3,000	3,000	3,000
Desalinated water	0	1,392	1,254	1,116
<b>Supply Total</b>	4,448	4,392	4,254	4,116
<b>Demand (after normal savings)<sup>a</sup></b>	4,448	4,392	4,254	4,116
Difference as % of Supply	0	0	0	0
Difference as % of Demand	0	0	0	0

Footnote:

<sup>a</sup> Calculated using a 2010 baseline demand value of 4,610, see Section 4 for methodology.

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<b>Table 5-12</b> <b>Supply and Demand Comparison – Single Dry Year</b> <b>(acre-feet/year)<sup>a</sup></b>				
	<b>2015</b>	<b>2020</b>	<b>2025</b>	<b>2030</b>
Supplier-produced groundwater	4,448	3,000	3,000	3,000
Desalinated water	0	1,392	1,254	1,116
<b>Supply Total</b>	4,448	4,392	4,254	4,116
<b>Demand (after normal savings)<sup>b</sup></b>	4,448	4,392	4,254	4,116
Difference as % of Supply	0	0	0	0
Difference as % of Demand	0	0	0	0

Footnotes:

<sup>a</sup> Assumes SqCWD would not call curtailment in a single-dry year.

<sup>b</sup> Calculated using a 2010 baseline demand value of 4,610, see Section 4 for methodology.

<b>Table 5-13</b> <b>Supply and Demand Comparison – Multiple Dry-Year Events</b> <b>(acre-feet/year)</b>				
	<b>2015</b>	<b>2020</b>	<b>2025</b>	<b>2030</b>
Supplier-produced groundwater	4,448	3,244	3,106	2,968
Desalinated water	0	1,148 <sup>a</sup>	1,148 <sup>a</sup>	1,148 <sup>a</sup>
<b>Supply Total</b>	4,448	4,392	4,254	4,116
<b>Demand Total (after normal savings)<sup>b, c</sup></b>	4,448	4,392	4,254	4,116
Difference as % of Supply	0	0	0	0
Difference as % of Demand	0	0	0	0

Footnotes:

<sup>a</sup> Assumes SqCWD would use 41% capacity of the 2,800 acre-feet/year of the proposed plant.

<sup>b</sup> Depending on drought stage and associated curtailment actions, some of the demand would be lessened, which would result in less groundwater pumping.

<sup>c</sup> Calculated using a 2010 baseline demand value of 4,610, see Section 4 for methodology.

*Checklist Item #41. An analysis of the impacts of each of the actions and conditions described in subdivisions (a) to (f), inclusive, on the revenues and expenditures of the urban water supplier, and proposed measures to overcome those impacts, such as the development of reserves and rate adjustments (10632(g)).*

An analysis of the financial impacts associated with each of the curtailment stages during a long-term water supply shortage due to drought or other emergencies is shown in **Table 5-3**.

### **Groundwater Overdraft**

In addition to short-term and long-term water supply shortages due to emergencies and prolonged drought, SqCWD has also established protocols for shortages due to groundwater overdraft. This type of emergency affects many or all users of the groundwater basin, not just District customers. It is the result of ongoing discharge in excess of the recharge of the aquifer, i.e., in excess of the sustainable yield. The undesirable result would be a combination of chronically depressed coastal groundwater levels, reversed seaward gradients, and degraded groundwater quality that collectively define seawater intrusion.

A groundwater emergency may be declared when it is demonstrated that a groundwater overdraft exceeding the sustainable yield threatens the public health, safety, and welfare of the community.

Specifically, the SqCWD shall employ the services of one or more qualified groundwater hydrologists to review groundwater monitoring data and periodically report on aquifer conditions. Where it is demonstrated by a professional hydrologist that the groundwater basin is experiencing groundwater overdraft exceeding the sustainable yield and where such degradation threatens the public health, safety and welfare of the community, a groundwater emergency may be declared to prevent further depletion and degradation of groundwater resources.

Prior to declaring a groundwater emergency, the SqCWD shall consult with neighboring water agencies, such as the Pajaro Valley Water Management Agency, Central Water District, City of Santa Cruz, and the County of Santa Cruz to explore joint options and/or programs that could be undertaken or adopted to possibly defray the need for such a declaration. If a cooperative effort cannot successfully address the concerns, then consideration will be given to declaring a groundwater emergency.

Such an emergency shall be declared by resolution of the Board after a public hearing to consider all relevant information such as, but not limited to, the most current groundwater studies, recommendations of other water purveyors with an interest in the basin, and other governments having water, land-use or other

relevant jurisdiction within the basin, and only after the following findings can be made:

1. The groundwater basin is experiencing overdraft conditions;
2. The addition of new wells or the expanded use of existing wells in order to meet supply needs will significantly increase the demand on the affected aquifer and thereby increase the overall overdraft; and
3. The continuation of the overdraft will result in further depletion and degradation of the water resource that can lead to, but is not limited to, impairment of the aquifer or allowing the ingress of poor quality or saline waters.

Upon being informed by the District's groundwater hydrologist that conditions exist which warrant declaration of a groundwater emergency; the Board of Directors shall receive the groundwater hydrologist's report and recommendations for appropriate actions at a public meeting. The Board of Directors shall act within its authority as established by AB 3030 and other applicable State Laws to address the groundwater emergency. Prior to implementing mandatory measures in response to a groundwater emergency, the Board of Directors shall conduct a public hearing on the proposed measures to be taken to reduce demand.

If a sufficient supplemental supply to address the issue is readily available to come online in the near future, then the Board may consider that declaring a groundwater emergency is not necessary.

#### **Immediate Measures to Alleviate Overdraft Emergency**

In areas where a groundwater emergency is declared, the Board of Directors shall take those actions identified in this WSCP and Action Plan 7 of the SqCWD ERP, as deemed appropriate to achieve the level of reduced demand recommended by the professional hydrologist based on the extent and severity of the groundwater emergency. Prior to declaring a Stage 3 or greater response, a peer review panel of two or more qualified groundwater hydrologists shall be formed to review and confirm the findings and recommendations of the District's hydrologist. In addition, the District's Board of Directors shall also consider the following potential actions:

1. Request the County to place a moratorium on new wells within the overdrafted aquifer, and request other water purveyors pumping from the aquifer to place a moratorium on service commitments and connections similar to any imposed by the SqCWD;
2. Request all other water purveyors utilizing the affected aquifer for water supply to implement water conservation measures and use restrictions consistent with those actions taken by the SqCWD to the extent feasible;

3. Request the County to require meters and monitoring of all wells within the impacted area, and to require water conservation measures and use restrictions by private well owners consistent with those actions taken by the SqCWD to the extent legally feasible;
4. Request the County to enact additional restrictions on agricultural water use within the affected area within its Groundwater Emergency policy; and
5. Take such other actions as authorized and appropriate within the joint powers shared with Central Water District as established by AB 3030 (Water Code Section 10750 *et seq.*)

**Long-term Measures to Alleviate Groundwater Overdraft**

The Board shall initiate actions such as, but not limited to, joint power agreements with other agencies and development of supplemental supply projects, with the goal of finding permanent solutions to the groundwater problem.

A groundwater emergency and the measures enacted to alleviate the emergency shall remain in effect until rescinded. A groundwater emergency shall be rescinded by resolution of the Board of Directors after a public hearing when one of the following findings is made:

1. Alternative water sources which compensate for the existing overdraft and supply the affected area are developed;
2. A groundwater management program is implemented which will allow for additional demand without contribution to groundwater overdraft as determined by the District's hydrologist and confirmed by a panel of two or more qualified groundwater hydrologists; or
3. The Board of Directors determines that new information is available which indicates that groundwater basin conditions are sufficiently improved and that the original findings of overdraft are no longer applicable after review by a panel of two or more qualified groundwater hydrologists.

The establishment of a groundwater emergency and all actions to alleviate the emergency shall be reviewed by the Board of Directors, and other governing boards who have implemented restrictions as the result of the emergency, within one year of the date of enactment of the measures at a public hearing to decide whether the declaration of emergency shall remain in effect.

## **Section 6: Demand Management Measures (DMMs)**

The Soquel Creek Water District (SqCWD) is committed to an effective water conservation program and has had a program in place since 1997. This section provides a description of the 14 specific water conservation demand management measures (DMMs, also referred to as Best Management Practices or BMPs) that SqCWD implements. Additionally, the implementation schedule, method(s) used to evaluate effectiveness, estimated conservation savings, and effect of the savings on SqCWD's ability to further reduce demand are also discussed for each DMM.

In 1997, a water conservation program analysis was developed as part of the SqCWD's Integrated Resources Plan (IRP) development. The purpose of the analysis was to evaluate the potential water savings from an expanded conservation effort using the list of Best Management Practices (BMPs) established by the California Urban Water Conservation Council (CUWCC) and to identify other potential demand management options. The BMPs were evaluated by a Public Advisory Committee (PAC) comprised of a representative mix of individuals within the service area, as well as SqCWD staff and consultants. The methodology used in the analysis to determine the most beneficial BMPs for the SqCWD is documented in the Draft Integrated Resources Plan (Montgomery Watson, 1999). In summary, each of the BMPs and other potential options were screened for technical feasibility, environmental impacts, implementation difficulty and customer acceptance. Cost/benefit was considered as a factor in developing the final list of recommended measures. Based on this analysis, the PAC recommended that SqCWD implement nine of the BMPs and ten variations of the BMPs.

Since the 1999 Draft Integrated Resources Plan, similar procedures have been used to evaluate and implement the remaining CUWCC BMPs, as well as other identified conservation measures that are described at the end of this section.

### ***Required Elements — DMMs***

*Checklist Item #26. (Describe and provide a schedule of implementation for) each water demand management measure that is currently being implemented, or scheduled for implementation, including the steps necessary to implement any proposed measures, including, but not limited to, all of the following: (A) water survey programs for single-family residential and multifamily residential customers; (B) residential plumbing retrofit; (C) system water audits, leak detection, and repair; (D) metering with commodity rates for all new connections and retrofit of existing connections; (E) large landscape conservation programs and incentives; (F) high-efficiency washing machine rebate programs; (G) public information programs; (H) school education programs; (I) conservation programs for commercial, industrial, and institutional accounts; (J) wholesale agency programs; (K) conservation pricing; (L) water conservation coordinator; (M) water waste prohibition; (N) residential ultra-lowflush toilet replacement programs (10631(f)(1) and (2).*

*Checklist Item #27. A description of the methods, if any, that the supplier will use to evaluate the effectiveness of water demand management measures implemented or described under the plan (10631(f)(3)).*

*Checklist Item #28. An estimate, if available, of existing conservation savings on water use within the supplier's service area, and the effect of the savings on the supplier's ability to further reduce demand (10631(f)(4)).*

The information requested above in Checklist Items #26, 27 and 28 is addressed below for each of the 14 individual DMMs.

### **A. DMM A – Single-Family and Multifamily Residential Water Survey Program**

**Status:** This DMM was implemented in 2003 and is currently ongoing. SqCWD plans to continue the residential survey program; however, surveys conducted over the last couple of years indicate that many indoor fixtures and appliances have been replaced with water efficient models. Due to this finding, the initial focus of the residential survey program has naturally shifted from replacing hardware to educating customers about SqCWD's conservation rebates, showing them how to read their water meters, adjust irrigation timers and detect leaks, and working with them to establish customized landscape watering schedules.

Within the next five years, SqCWD plans to conduct a study to determine the degree of market saturation for water efficient indoor fixtures. The results of this study may result in further changes in the scope or focus of this DMM.

**Description:** When the DMM was implemented in 2003, the surveys were offered to existing single-family and multifamily residential customers with a history of high water use. At this time, SqCWD evaluated water bills to identify the top 20 percent of water users in both single-family and multifamily categories. The SqCWD mailed these customers a letter offering a free water survey, and scheduled a survey for those who responded. Some telephone follow-up was performed for customers who did not respond to the survey offer.

The residential surveys evaluate both indoor and outdoor water use. Each single-family survey takes approximately one hour; multifamily surveys take longer, depending on the building size and the complexity of the irrigation system.

SqCWD staff performs the surveys year-round. Prior to conducting the survey, staff reviews the participating customer's water use history and distributes materials that explain the survey. Additionally, staff requests that customers be present and participate in the survey.

Specific activities for each indoor residential survey include:

- Locating the water meter and teaching customers how to read it;

- Checking for faucet and toilet leaks and recommending any necessary repairs;
- Adjusting toilet tank float arms, as necessary, to eliminate any waste overflow;
- Installing faucet aerators and low-flow showerheads in bathrooms where needed;
- Identifying opportunities to replace toilets, clothes washing machines, etc., with water conserving models; and
- Educating customers about applicable SqCWD rebates.

The outdoor survey consists of the following activities:

- Providing basic literature and guidance about irrigation and landscaping (e.g., mulching, water efficient plant material, soil, water, and plant relationships);
- Recommending adjustments to the irrigation system to correct identified leaks, over-spray, and runoff;
- Collecting information about grass type, soil type and precipitation rate of the existing irrigation system, and developing a customized irrigation schedule in minutes of watering time per week for spring, summer, and fall;
- Collecting information about landscaping to assist with the design of other landscape conservation programs;
- Advising customers about the benefit of low-water use landscaping;
- Providing irrigation schedules and controller adjustments; and
- Educating customers about applicable SqCWD rebates.

SqCWD staff provides survey findings and recommendations to the customer both orally and in a written report. Staff provides the customer water-conservation tips and information on other SqCWD conservation programs. The survey, water conservation literature, low-flow showerheads, faucet aerators, hose nozzles, hose timers, and watering schedules are provided at no charge to the customer. These incentives are advertised in the program literature used to publicize the program. Staff sometimes even installs the low-flow shower heads and faucet aerators.

The on-going residential survey program has been promoted using a variety of methods including print advertisements in local newspapers, SqCWD newsletters, billing messages, and public outreach events. Another method that was used to generate participation in the survey program was through the SqCWD Water Demand Offset Program (WDO) – described at the end of this section under “Additional Conservation Measures.” When customers called to request a free toilet from the WDO toilet replacement program, SqCWD staff also provided a free residential survey.

The multifamily residential survey program targets building owners and management companies. The multifamily surveys are marketed through direct contact with property owners and/or management companies, and by direct mail for the owners of smaller buildings. Conservation staff also has made presentations to Home Owners Associations (HOAs) to generate interest and participation in the program.

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Institutional and commercial customers also are offered free water use surveys for indoor and outdoor uses. Please see DMM I for further description.

**Implementation Schedule:** **Table 6-1** shows the number of single-family and multifamily surveys conducted from 2003-2010, the estimated implementation schedule for 2011-2015, and the estimated historical and projected conservation savings from the residential survey program.

**Methods to Evaluate Effectiveness:** For each dwelling unit, the surveyor completes a standard customer data form (including number of people per household, number of bathrooms, age of appliances, and lot and landscaped area square footage). The data collected during the survey are entered into a database for easy tracking. The data are periodically used by SqCWD to compare the customer's water use prior to and after the survey and to refine the program.

**Conservation Savings:** The annual water savings estimates from the residential survey program for 2003-2010, are shown below in **Table 6-1**. The estimates assume a 5-gallon savings per day per survey for single-family residences, and an average 20-gallon savings per day per survey for each multifamily housing development.

<b>Table 6-1</b> <b>DMM A: Single-Family and Multifamily Residential Survey Program</b>				
<b>Year</b>	<b>Completed Number of Single-Family Surveys</b>	<b>Completed Number of Multifamily Surveys</b>	<b>Estimated Annual Water Savings (gallons)<sup>a</sup></b>	<b>Estimated Annual Water Savings (acre-feet)</b>
2003	232	57	839,500	2.6
2004	490	60	1,332,250	4.1
2005	320	12	671,600	2.1
2006	118	15	324,850	1.0
2007	373	52	1,060,325	3.3
2008	679	94	1,925,375	5.9
2009	131	30	458,075	1.4
2010	168	33	547,500	1.7
<b>2003-2010 Total</b>	<b>2,511</b>	<b>353</b>	<b>7,159,475</b>	<b>22.0</b>
<i>2011 (projected)</i>	<i>96</i>	<i>8</i>	<i>233,600</i>	<i>0.7</i>
<i>2012e</i>	<i>48</i>	<i>12</i>	<i>175,200</i>	<i>0.5</i>
<i>2013e</i>	<i>48</i>	<i>12</i>	<i>175,200</i>	<i>0.5</i>
<i>2014e</i>	<i>48</i>	<i>12</i>	<i>175,200</i>	<i>0.5</i>
<i>2015e</i>	<i>48</i>	<i>12</i>	<i>175,200</i>	<i>0.5</i>

Footnote:

<sup>a</sup> Assumed that each single-family residential survey results in a water savings of 5 gallons/day/survey, and each multifamily survey results in a water savings of 20 gallons/day/survey.

**Effect of Water Savings on SqCWD's Ability to Further Reduce Demand:** As low-flow showerheads and toilets have become more prevalent and water-efficient technology for other indoor fixtures has evolved, the effect of water savings associated with this DMM on the ability of the SqCWD to further reduce demand is moderate. It is expected that the amount of savings that can be achieved by future implementation of this DMM will decrease over time. However, the survey program is expected to continue through at least 2015 and will likely continue to shift focus to increasing outdoor water efficiency as indoor water efficiency efforts reach saturation.

## **B. DMM B – Residential Plumbing Retrofit**

**Status:** The Residential Plumbing Retrofit DMM, which overlaps with retrofits initiated under DMM A, was started in 1998 and is ongoing. As discussed above in DMM A, surveys conducted over the last couple of years indicate that low-flow showerheads and faucets are becoming more prevalent. However, SqCWD continues to provide a moderate number (i.e., approximately 25 per month) of 1.5 gpm showerheads to customers via surveys, a shower efficiency exhibit located in our customer service lobby, and outreach events. A study to determine the degree of market saturation for water efficient indoor fixtures will determine whether this DMM, or a modified version of this DMM, will remain a component of SqCWD's future conservation program.

**Implementation Description:** Since 1998, the SqCWD has distributed free showerheads, faucet aerators, low-flow hose nozzles, and toilet tank leak detection tablets to customers in its service area. These devices are currently distributed at the headquarters office, at community events, by the customer service field crew, and by conservation staff during customer surveys. In addition, the SqCWD tracks high-water use and mails out leak detection tablets to customers whose water use has increased dramatically during a billing cycle. The mailer includes information on how to conduct a toilet leak test and the sources of a toilet tank leak.

Enforceable codes and ordinances also exist in the SqCWD service area requiring the retrofit of: (1) High-flow toilets (greater than 1.6 gallons per flush (gpf)), urinals (greater than 1.0 gpf) and showerheads (greater than 2.5 gpm) with low-flow models upon sale of a property; and (2) plumbing fixtures in bathrooms and kitchens that are being remodeled in accordance with a City of Capitola or County of Santa Cruz building permit.

The two local jurisdictions and codes governing property sale retrofits, also referred to as Retrofit on Resale (ROS), are:

- City of Capitola Municipal Code 13.01, and
- Santa Cruz County Code Chapter 7.69.

SqCWD is working with these agencies to revise the efficiency requirements currently specified in their codes to incorporate newer, more water efficient technology. For instance, toilets would need to use 1.28 gpf or less (vs. 1.6 gpf); urinals would need to use 0.5 gpf or less (vs. 1.0 gpf); and showerheads would need to use 2.0 gpm or less (vs. 2.5 gpm).

Compliance with these codes within the SqCWD service area is monitored by SqCWD with a software system that tracks property sales and compares them with submittal of retrofitted compliance forms that realtors provide to their clients. If a compliance form has not been submitted for a given property sale, SqCWD will send out a letter requesting compliance within a given timeframe. If corrective action is not taken by the new property owner, SqCWD may record a violation on the property title. SqCWD staff also performs on-site inspections to verify that the required retrofits have been performed.

In addition to the abovementioned codes, SqCWD adopted an Indoor Water Use Efficiency Ordinance in August 2010 that requires the installation of low-flow plumbing fixtures and appliances in existing bathrooms and/or kitchens that are being remodeled in accordance with building permits. These efforts are coordinated with the City of Capitola and the County of Santa Cruz Planning Departments. Building permit applicants must submit a completed Indoor Water Use Efficiency checklist to the SqCWD certifying that they will install fixtures and appliances that meet the SqCWD's minimum water use efficiency requirements. SqCWD staff performs on-site inspections to verify that the efficiency requirements have been met.

**Implementation Schedule:** The SqCWD plans to continue implementing the Residential Plumbing Retrofit DMM until it can be demonstrated that market saturation has been achieved. The historical and estimated future implementation schedule for providing free water-efficient showerheads and faucet aerators, as well as leak detection tablets, is shown in **Table 6-2**. The number of devices shown in Table 6-2 includes those provided as part of the residential survey program discussed above (i.e., DMM A).

Table 6-2 DMM B: Residential Plumbing Retrofit						
Year	Showerheads		Aerators		Leak Detection Tablets	
	Single-Family	Multi-Family	Single-Family	Multi-Family	Single-Family	Multi-Family
2003	230e	150e	460e	300e	500	200
2004	490e	180e	980e	460e	1,200	500
2005	320e	240e	640e	480e	1,200	500
2006	250e	60e	500e	120e	1,200	500
2007	250e	60e	500e	120e	1,200	500
2008	250e	60e	500e	120e	1,200	500
2009	250e	60e	500e	120e	1,200	500
2010	250e	60e	500e	120e	1,200	500
2011	312e	90e	240e	72e	1,200	500
2012	300e	85e	200e	50e	1,200	500
2013	300e	85e	200e	50e	1,200	500
2014	300e	85e	200e	50e	1,200	500
2015	300e	85e	200e	50e	1,200	500
e = estimated conservatively based on approximately one showerhead and two aerators per survey, as well as fixtures provided to customers at SqCWD headquarters and public outreach events.						

The ROS codes cited above, and SqCWD's Indoor Water Efficiency Ordinance as applicable to remodels, will increase the rate at which this DMM is implemented for showerheads and toilets. For reference, a property search showed that 478 home sales within the SqCWD service area were subject to the ROS plumbing requirements in 2010. The SqCWD Indoor Water Efficiency Ordinance is more stringent, requiring toilets that use 1.28 gpf or less, showerheads that use 2.0 gpm or less, and bathroom faucets or faucet aerators that use 1.5 gpm or less in all bathroom remodels that require a building permit.

**Methods to Evaluate Effectiveness:** As indicated above for DMM A, SqCWD periodically compares a customer's water use prior to and after a survey to gauge effectiveness. In the future, SqCWD plans to conduct a study to determine the degree of market saturation for water efficient indoor fixtures. Results from the study will determine whether this DMM, or a modified version of this DMM, will remain a component of SqCWD's future conservation program.

**Conservation Savings:** The yearly water savings from implementation of DMM B, exclusive of DMM A, can not be accurately estimated as SqCWD only tracks the total number of fixtures given out on an annual basis. Additionally, it can not be verified that showerheads provided to customers independent of a SqCWD survey have actually been installed within the service area, or that customers have used the provided leak detection tablets, identified a leak, and made necessary repairs.

It is also difficult to quantify water savings associated with plumbing retrofits performed under the ROS program. SqCWD staff currently verifies that recently sold properties meet the applicable County of Santa Cruz or City of Capitola code after applicable retrofits have been made. In many cases, it is not known what type of fixtures existed prior to the property sale and retrofit, thereby making it difficult to accurately calculate water savings.

**Effect of Water Savings on SqCWD's Ability to Further Reduce Demand:**

The effect of water savings associated with this DMM on the ability to further reduce demand is believed to be moderate. It is expected that the amount of savings that can be achieved by future implementation of this DMM will decrease over time as indoor water-efficiency fixtures reach or exceed saturation.

**C. DMM C – System Water Audits, Leak Detection, and Repair**

**Status:** This DMM is ongoing and is incorporated into SqCWD's operations and maintenance procedures.

**Implementation Description:** The three main ways SqCWD monitors for leaks include: (1) when a meter read is abnormally high, staff evaluates the meter and potentially notifies customers of a possible leak, (2) the automated meters provide a signal upon being read that indicates if the meter has run nonstop for 24 hours, thus indicating a potential leak, and (3) digital correlating loggers are used by SqCWD to pinpoint the exact location of system leaks.

When reading meters manually, about 3 leaks per a typical route (250 reads) are detected. The automated meter reading indicates about 8 leaks per typical route. SqCWD has a system to follow up and track if leaks have been addressed. Letters of notification are sent out if the leaks are not addressed. If the leaks are not addressed after the third letter, then the water is reduced or shut off.

SqCWD operations and maintenance staff have had a program in place for many years to detect and repair leaks within the distribution system. However, in 2010, SqCWD purchased an advanced digital leak detection system manufactured by Flow Metrix, Inc. called Z Corr to enhance the leak detection program. This system uses a network of digital correlating loggers to pinpoint the exact location of leaks. SqCWD operations and maintenance personnel systematically place eight loggers on valves and other pipe fittings within a selected geographical zone for a one night period. The loggers collect three sets of data in 15-minute intervals throughout the night. The following day, personnel collect the loggers and place them into a docking station. The docking station connects to a central computer and an analysis is automatically performed, pinpointing the locations of any leaks. If the leaks are within the SqCWD distribution system, they are added to a map and a work order is issued to repair the leak. The SqCWD maintains data on detected leaks within the distribution system and estimates losses associated with those leaks. If the

identified leak is within the customer's distribution system, the customer is notified and is asked to repair the leak.

SqCWD operations and maintenance staff started using this system in service area 4 (La Selva Beach) and are systematically moving up through the other three service areas. To date, approximately 30 percent of the SqCWD's total service area has been monitored with this equipment.

SqCWD also has a capital improvement program in place to systematically replace water mains and services throughout the distribution system. Areas that are either prone to leaking, are undersized, or are constructed of materials now considered inferior, are given the highest priority for replacement. Since 1969, approximately 144 miles of water mains have been replaced. Approximately 7.2 miles of mains were replaced from 2006-2010.

**Implementation Schedule:** The SqCWD will continue to implement the leak detection program.

**Methods to Evaluate Effectiveness:** SqCWD Accounting and Operations and Maintenance staff annually review the system production and water sales data records to confirm that non-revenue water losses stay under 7.5 percent. SqCWD uses the American Water Works Association (AWWA) Water Audit Software on an annual basis to evaluate the amount of unaccounted for water.

**Conservation Savings:** For leaks that are detected throughout SqCWD's distribution system, personnel estimate and document the volume of water loss. However, in order to calculate a water savings associated with this DMM, many assumptions would need to be made regarding the amount of time a leak could have potentially continued before being detected. As these types of estimates are too speculative, SqCWD does not calculate an associated conservation savings.

**Effect of Water Savings on SqCWD's Ability to Further Reduce Demand:** The past water savings achieved by implementation of this DMM do not have an effect on SqCWD's ability to further reduce demand as leaks will continue to occur over time as components of the water distribution system age.

#### **D. DMM D – Metering with Commodity Rates**

**Status:** Metering has been required for all service connections since the SqCWD was formed in 1964, and commodity (or conservation) rates for residential water usage have been in place since 1999. In 2006, SqCWD initiated a program to replace manual-read meters with automated radio read meters. Approximately half of the manual-read meters have been replaced to date, and the remaining meters are expected to be installed by 2015.

**Description:** The SqCWD has historically required meters on all services. In 2003, the SqCWD adopted a policy requiring new development to install separate meters for each unit on a parcel in multifamily housing, and each separate unit within a larger multi-unit commercial development. Additionally, dedicated landscape meters for all new multifamily, commercial and institutional development have been required for conservation purposes since 2003. Prior to 2003, many new developments were required to install irrigation meters to meet engineering requirements. As of August 2010, dedicated landscape meters are also required for new single-family development when the parcel size of the development is greater than 10,000 square feet.

In 2006, SqCWD initiated a pilot program to replace 110 conventional manual-read meters within a specific service route with automated radio read meters. Automated radio read meters can be read from a service vehicle while driving down the street. The data collected from the read is then transmitted to the SqCWD billing system and customer bills are generated. The pilot program was successful so it was expanded with the goal of replacing all conventional meters within the service area.

In addition to saving money by increasing the speed of meter reading and making it less difficult for personnel to obtain usage data, automatic meter reading (AMR) technology significantly benefits water conservation programs in other ways. For example, SqCWD uses AMR technology to collect data on rate of flow, to detect and pinpoint leaks in the distribution system, and to resolve customer concerns and issues about their water use. The software associated with this technology allows water use to be logged and quantified in a graphical format to the minute, hour, 24-hour, previous and current billing periods.

To date, SqCWD has replaced approximately 7,500 meters with AMR technology, and installation is about 50 percent complete. It is expected that this project will be complete by 2015.

An additional improvement that helps capture low-flows through larger meters is the replacement of noncompound meters (equal to or greater than two inches in size) with compound meters that also utilize AMR technology. Compound meters are a combination of two water meters – one large to measure higher flows, and one small to measure lower flows. Compound meters are capable of handling and accurately measuring an extremely broad range of flow rates, thus reducing the chances of under-billing or over-billing the customer.

With the implementation of the meter replacement program, SqCWD does not currently test meters on a routine basis to determine accuracy. The new meters are very efficient and have a 20-year lifecycle with a 100 percent warranty up to ten years and a prorated warranty for years ten through twenty. However, if the accuracy of a meter is questioned by a customer, they have the option of paying to

have the meter tested. SqCWD may institute a testing program for the larger meters in the next two to three years as the meter service time increases.

In regards to commodity rates, all single-family residential customers are billed based on the quantity of water used, and the pricing structure consists of three tiers. Currently, for residential customers with 5/8-inch meters (which account for more than 95 percent of single-family residential accounts), the first tier is for water usage up to 8 units, the second tier is for 9-30 units, and the third tier is for 31 units or more (one unit of water equals 748 gallons). For a standard 5/8-inch meter, the 2011 single-family domestic water use rates are as follows:

- \$3.22/unit for 1-8 units;
- \$6.15/unit for 9-30 units; and
- \$10.65/unit for 31 units and above.

Tier thresholds for larger single-family residential meters are set proportionally with the same quantity charges for each tier. Multifamily residential and non-domestic customers are currently billed a flat rate of \$5.07/unit. Conservation pricing is discussed below in greater detail in DMM K.

Metering with commodity rates is an effective conservation measure that directly associates cost with the amount of water used. It also provides a means for SqCWD to identify, monitor and assist high use customers. The SqCWD's computer system registers increases in individual service consumption. The computer system will generate a written notice to the customer alerting them to check for leaks if there is a substantial or notable increase in consumption. If there is an extreme increase, a service representative is dispatched to make personal contact with the customer and investigate.

**Implementation Schedule:** The SqCWD will continue to require meters on all new services, including individual unit meters for multifamily housing and non-domestic development. Additionally, SqCWD will continue to replace existing conventional manual-read meters with automated radio read meters throughout the service area until this project is complete.

**Methods to Evaluate Effectiveness:** The most important method used to evaluate the effectiveness of water metering is the capability to download data from the automated radio read meters. Additionally, as the result of an aggressive meter replacement program, approximately half of the meters in the SqCWD service area are less than five years old and are expected to remain functional for an additional 15 years.

**Conservation Savings:** It is not possible to quantify a SqCWD-specific conservation savings from this DMM at this time; however, studies have shown that metered accounts average a 20 percent reduction in demand as compared to non-

metered accounts (Vickers, 2001). Also, as meters get older, they tend to measure less water than is actually being transmitted. As at least half of the SqCWD meters are new, it would be expected that they are very accurate in regards to measuring water consumption.

As more AMR technology is installed throughout the remainder of the service area and rates continue to increase, it is anticipated that water usage will continue to decrease due to this DMM. However, since SqCWD has had metering in place for approximately 40 years, we have likely not experienced as significant water savings as providers who may have recently implemented metering technology. Rates, when coupled with AMR technology, will be a more significant factor in reducing water use throughout the service area.

**Effect of Water Savings on SqCWD's Ability to Further Reduce Demand:**

The conservation savings already achieved by implementation of this DMM, in regards to metering technology alone, is believed to have a moderate impact on the SqCWD's ability to further reduce demand. It is anticipated that further savings will occur as the remaining manual-read meters are replaced with AMR technology, and then savings due to metering alone will taper off. However, the AMR technology will continue to provide savings over the long-term when used to identify leaks.

**E. DMM E – Large Landscape Conservation Programs and Incentives**

**Status:** Implementation of this DMM began in 2003 with the creation of a new position (Water Conservation Specialist) and development of an irrigation survey program and is currently ongoing. It is anticipated that this DMM will be continued through 2015, and will be expanded to assign and monitor site-specific water budgets for landscapes greater than one acre in size.

**Implementation Description:** This DMM is designed to improve irrigation efficiency and reduce peak water demand and is offered free of charge to green belts, common areas, multifamily housing landscapes, schools, business parks, cemeteries, parks, golf courses and publicly owned landscapes on or adjacent to roadways. Modeled after the successful program implemented by North Marin Water District (NMWD) and NEOS Corporation in 1989, SqCWD has a trained Water Conservation Specialist who provides a system maintenance check-up, designs a baseline irrigation schedule, provides periodic performance feedback, and conducts follow-up field visits as needed.

In general, participants in this program:

- Learn the targeted site's current irrigation efficiency and recommended water budget;
- Receive advice on available low-cost hardware improvements to increase efficiency;
- Receive baseline irrigation schedules;

- Receive instructions about how to modify irrigation schedules according to weather changes;
- Learn about the SqCWD's landscape rebates; and
- Receive water savings information.

In 2010, SqCWD had approximately 180 dedicated irrigation meter accounts which comprised about four percent of the total water use within the service area. Approximately 15 of these accounts have worked with the Water Conservation Specialist over the years to reduce their water use.

Irrigators of landscapes larger than three acres were the first candidates targeted for this measure; however, the program was later expanded to include sites less than three acres. Sites with landscapes greater than three acres were first screened to determine their savings potential under this service. The screening correlated billed water use with irrigated area and local evapotranspiration (ET) data to estimate overall irrigation efficiency and to ensure the existing system met minimum design and operation standards to benefit from the survey. The owners of sites that appeared to have water savings potential were offered a survey by mail and telephone.

Approximately ten large landscape sites agreed to participate in the initial phase of this DMM. These customers received a survey according to their needs, addressing the lowest efficiencies first and according to the program budget. During the initial site survey, the Water Conservation Specialist evaluated each irrigation system's design, operating condition, and current overall efficiency, and made recommendations for low-cost improvements (i.e., aligning sprinkler heads, replacing broken heads, or trimming grass that disrupted spray patterns) to improve efficiency.

After recommended customer improvements were made, SqCWD staff proceeded with a detailed irrigation survey to determine precipitation rate, distribution uniformity, grass type, root depth, and soil type. Surveys were conducted according to industry standard methods. Acquired data were used to develop a base irrigation schedule showing weekly watering times for every month. The schedule was provided in a brief written report to the site manager or property owner for implementation. A follow-up check was done to assess implementation and satisfaction and to adjust schedules as needed.

Follow-up surveys are provided as requested by the customer, or as initiated by SqCWD as a result of water waste/ordinance enforcement and/or spikes in billable water use. At the time this program was implemented, it was anticipated that follow-up surveys would be conducted every five years. However, most of the sites have been re-evaluated more frequently as a result of observed water waste, high water use, and/or landscape rebate evaluations.

**Implementation Schedule:** A future component of this DMM will be the establishment of water budgets for irrigated landscapes over one acre in size, and periodic monitoring to verify compliance with the budget. In cases where the assigned water budget is exceeded, the customer will be required to have a certified irrigation auditor perform a water audit and implement changes as necessary to reduce water consumption consistent with the budget. It is anticipated that this program will be initiated in 2012.

**Methods to Evaluate Effectiveness:** Staff periodically reviews pre- and post-survey water consumption data to determine program effectiveness and water savings. Staff has developed a working relationship with landscape managers and contractors as a result of implementing this program during the past 8 years, and continually works with key individuals to improve water use efficiency.

**Conservation Savings:** Based on an independent analysis of the NMWD program, water savings for audited sites was 14 percent. Evaluation of water use data for customers within the SqCWD service area that have participated in this program has shown similar reductions to the NMWD sites. More detailed estimates of conservation savings associated with this DMM will be determined after water budgets for applicable sites have been assigned and sufficient post-budget water use data is available.

**Effect of Water Savings on SqCWD's Ability to Further Reduce Demand:** The effect of water savings achieved by implementation of this DMM on the ability of the SqCWD to achieve further reductions is believed to be minor. Additional sites will be evaluated in the future, many of which have not previously taken advantage of this free service. Therefore, it is anticipated that additional savings can be achieved. Lastly, while the participating sites have achieved reductions in water use due to efficiency improvements and turf replacement, irrigation systems require regular maintenance and oversight in order to continue to operate efficiently; therefore, sustained savings at initial levels are unlikely.

## **F. DMM F – High-Efficiency Washing Machine Rebate Programs**

**Status:** SqCWD began offering rebates for high-efficiency clothes washing machines in 1999 and this program is still ongoing, although the rebate amounts and qualifying criteria have changed over the years.

**Implementation Description:** Clothes washing machines account for approximately 20% of indoor residential water use. Recognizing this, the SqCWD first offered a \$100 credit in 1999 to residential customers who purchased and installed SqCWD-approved high-efficiency washing machines. The program has since changed to offer a \$100 rebate to residential customers and a \$200 rebate to commercial customers who install high-efficiency washing machines that have been designated as Energy Star-approved. Energy Star is a United States Environmental

Protection Agency voluntary program in which product manufacturers can receive certification for their products if they meet designated energy and water efficiency criteria. To qualify for the Energy Star designation, washers must have a Water Factor less than or equal to 6.0. The Water Factor is defined as the number of gallons used per wash cycle per cubic foot of washer capacity.

The high-efficiency washer rebate program works as follows:

- After purchasing a high-efficiency washing machine that meets SqCWD's criteria, the customer submits an Indoor Rebate Application and the original dated sales receipt to SqCWD.
- If requested by SqCWD staff, the customer must allow staff to conduct an on-site inspection as a condition of rebate approval.
- After SqCWD approval, the rebate appears as a credit on the customer's water bill.

**Implementation Schedule:** As shown in **Table 6-3**, 3,467 residential high-efficiency clothes washer rebates and 46 commercial washer rebates have been issued since 1999. The SqCWD anticipates continuing to implement this DMM through 2015. SqCWD is currently considering modifications to the commercial washer rebate program in an effort to increase participation, particularly amongst coin-operated laundries that are using multi-load washers. The multi-load commercial washers are significantly more expensive than single-load washers used in most residences, and an increase in the current rebate amount of \$200 may entice commercial laundry owners to retrofit these units.

Table 6 – 3 DMM F: High-Efficiency Clothes Washer Rebate Program				
Year	# of Residential Washer Rebates	Estimated Annual Residential Water Savings (acre-feet)	# of Commercial Washer Rebates	Estimated Annual Commercial Water Savings (acre-feet)
1999	118	2.4	na	0
2000	246	4.9	na	0
2001	245	4.9	na	0
2002	225	4.5	na	0
2003	266	5.3	15	0.7
2004	333	6.7	16	0.8
2005	288	5.8	13	0.6
2006	420	8.4	0	0
2007	336	6.7	0	0
2008	324	6.5	0	0
2009	276	5.5	0	0
2010	390	7.8	2	0.1
<b>1999 -2010 Total</b>	<b>3,467</b>	<b>69.4</b>	<b>46</b>	<b>2.2</b>
<i>2011 (projected)</i>	<i>240</i>	<i>4.8</i>	<i>5</i>	<i>0.2</i>
<i>2012e</i>	<i>240</i>	<i>4.8</i>	<i>10</i>	<i>0.5</i>
<i>2013e</i>	<i>200</i>	<i>4.0</i>	<i>7</i>	<i>0.3</i>
<i>2014e</i>	<i>180</i>	<i>3.6</i>	<i>5</i>	<i>0.2</i>
<i>2015e</i>	<i>160</i>	<i>3.2</i>	<i>5</i>	<i>0.2</i>
<i>e = estimated</i>				

**Methods to Evaluate Effectiveness:** SqCWD uses tracking software to determine the number of washer rebates granted per customer. The number of rebates multiplied by the average water savings from high efficiency clothes washers also provides an approximate SqCWD-wide water savings from this method. In the future, SqCWD will likely conduct a study to determine the degree of market saturation for water efficient indoor fixtures. Results from the study will determine whether this DMM, or a modified version of this DMM, will remain a component of SqCWD's future conservation program.

**Conservation Savings:** The average water consumption of a non-Energy Star qualified clothes washer is 31.07 gallons per load per unit, whereas the average water consumption of an Energy Star qualified model is 14.38 gallons per load per unit. Based on these factors, Energy Star washers save an average of 16.69 gallons per load. Residential washers are estimated to run an average of 390 loads per year. The Energy Star webpage cites DOE Federal Test Procedure 10 CFR 430, and commercial washers are estimated to run 950 loads per year. The Energy Star webpage cites the Multifamily Laundry Association, 2002 (Energy Star 2011).

Therefore, a high-efficiency residential washer retrofit saves approximately 6,542 gallons per year per unit, and a high-efficiency commercial washer retrofit saves about 15,586 gallons per year per unit.

To calculate the estimated water savings from the residential washer rebate program, SqCWD multiplied the annual savings per residential washer rebate (i.e., 6,542 gallons) by the number of rebates issued per year. The total estimated savings from implementation of this DMM in the residential sector is 69.4 acre-feet through 2010. Total estimated water savings from commercial washer rebates was calculated by multiplying the estimated annual water savings per commercial retrofit (i.e., 15,586 gallons) by the number of rebates issued per year, resulting in a total savings of 2.2 acre-feet through 2010.

**Effect of Water Savings on SqCWD's Ability to Further Reduce Demand:** The conservation savings already realized through implementation of this DMM indicate that it has a moderate effect on the ability of SqCWD to further reduce demand.

## **G. DMM G – Public Information Programs**

**Status:** Several of SqCWD's public information programs have been in place since the 1990's. This DMM is ongoing and continues to be modified and enhanced in order to meet the informational needs of the public.

**Implementation Description:** The SqCWD public information programs promote efficient water use. A 1991 study of the SqCWD's customer communication needs by the Argent Group recommended that the SqCWD focus efforts on heightening community awareness of groundwater management and water quality issues. Shortly thereafter, a SqCWD customer newsletter was developed to provide information on major projects, water quality concerns, conservation activities, and other SqCWD issues. In 1998, the SqCWD hired a full-time communications and conservation coordinator to expand the SqCWD's public outreach and conservation programs. In 2004 and 2010, SqCWD conducted additional statistically valid customer surveys to identify areas on which to focus outreach and education.

Public information is still a significant component of the SqCWD conservation program and is expected to continue as part of our water supply management activities. Public outreach programs include:

- Publishing a bi-monthly newsletter (*What's on Tap*) that is mailed with customer bills. The newsletter keeps SqCWD customers informed of current SqCWD activities including water supply, conservation, and incentive programs.
- Redesigning SqCWD water bills to show units and gallons used per day for the last billing period compared to the same period during the previous year.

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- Participating in a 6-agency county-wide Water Conservation Coalition, which coordinates a county-wide communication program with the public and the media about water conservation and other water resource issues. The Coalition maintains a website [www.watersavingtips.org](http://www.watersavingtips.org) which provides the public with access to water conservation information and links to the member agencies' individual websites.
- Hosting a website [www.soquelcreekwater.org](http://www.soquelcreekwater.org). Since 1999, SqCWD has maintained a website where customers can obtain information on SqCWD's conservation programs, download applications for rebate programs, read past issues of the SqCWD customer newsletter, and link to numerous other sites pertaining to water conservation. SqCWD redesigned its website in 2010.
- Providing a water-smart landscaping website tool. The Water Conservation Coalition developed and launched the Water-Smart Gardening website for Santa Cruz County with GardenSoft in 2010 to provide the public with low water use plant choices and water-smart gardening resources ([www.santacruz.watersavingplants.com](http://www.santacruz.watersavingplants.com)).
- Providing free low-flow showerheads, faucet aerators, positive shut-off hose nozzles, shower timers, leak detection tablets, hose timers, soil moisture meters and other water conserving tools to customers during service calls, residential or commercial surveys and public outreach events, or upon customer request.
- Participating in a number of community events including the Cabrillo College Mother's Day Plant Sale, the Aptos Farmers' Market, the Aptos and Capitola Chamber of Commerce Business Showcase, the Garden Faire in Scotts Valley, the Santa Cruz County Fair and the Aptos/La Selva Fire District's Open House where rebate and water conservation information is promoted. Free conservation devices are distributed based on the event's theme.
- Providing a Water-wise Garden Mini Grant Program which funds innovative projects designed to encourage public acceptance, desire for, and use of water-wise landscapes. This grant program, which pays for plants, irrigation systems and educational signs, is available to schools, nonprofit organizations, and public agencies. Grants are awarded from \$250 to \$2,000 per grant per year.
- Providing presentations on water conservation and water supply planning to various community groups, including Home Owner's Associations, real estate groups, business associations, service groups, advocacy groups, etc.
- Establishing and maintaining a video and book resource lending library. The library contains a small, yet valuable, collection of books, videos and compact disks that are available for loan to the public.
- Creating a demonstration garden. On an empty parcel next to the SqCWD, a small demonstration garden was planted through a series of community workshops since 2005. The garden area features low water use plants, native grasses and synthetic turf and has been a space for experimenting with plant survival with little to no watering during the summer. The landscaping around the headquarters, while also featuring low water use plants, is in the

process of rehabilitation and redesign. It has been re-envisioned to more consciously educate the public about water-wise landscaping techniques and better storm-water management. Funding from California's Proposition 84 Urban Greening Project Grant for a Low Impact Development Landscape Demonstration Project was received to assist with implementing the re-landscaping project. The first phase of the project was installed in the winter of 2010 and features a rain garden swale, a 3,000-gallon cistern with a first flush device and pressure system for distributing the water through a drip irrigation system to water the low water use plants. A small 400-square-foot lawn was removed in May 2011 and replaced with meadow grasses and low-water use plants that were donated by Suncrest Nurseries. Other phases of the demonstration garden project are planned for 2011 and 2012. Educational tours will be available upon project completion to further educate the public about low-water landscape alternatives.

- Publishing at least one conservation ad per month in the local newspapers and teaming with other agencies to promote conservation through other media outlets.
- Developing and distributing educational brochures to customers free-of-charge.
- Publishing conservation articles and authoring press releases for local newspapers and supplements.
- Writing a monthly column for the local newspaper (Santa Cruz Sentinel) regarding water issues.
- Participating in public television programs. SqCWD staff have participated in three one hour-long shows on Community Television of Santa Cruz County (fall 2009, winter 2007, and spring 2005) concerning conservation and the local water supply issues. Each show was aired several times. Copies of the shows also are available for loan from SqCWD.
- Reinstating a "welcome package" for new customers to inform them about the District and local water issues.

**Implementation Schedule:** The SqCWD will continue to provide outreach and public information through the methods described, although some programs may be modified or removed and others added as necessary in an effort to continually improve public information programs.

**Methods to Evaluate Effectiveness:** The SqCWD will periodically conduct customer surveys and compare findings to past results to determine how outreach programs can be improved.

**Conservation Savings:** The SqCWD has no method to quantify the water savings associated with this DMM, but believes that this program has and will continue to attract new rebate applicants and raise public awareness about water supply and water conservation issues in the SqCWD service area.

**Effect of Water Savings on SqCWD's Ability to Further Reduce Demand:**  
The water savings achieved from this DMM is believed to positively impact SqCWD's ability to further reduce demand.

## **H. DMM H – School Education Programs**

**Status:** SqCWD first implemented school education programs in 1980 and continued through 1992. In 2000, the SqCWD re-established and expanded its school education program into the robust program that exists today.

**Implementation Description:** The following school education programs and services are currently offered to schools throughout the SqCWD service area and, depending upon the specific program, to a wider area throughout Santa Cruz County. The program is promoted through direct mail to the principals and teachers in the service area in September and January. Presentations and educational resources are provided by request from teachers. Classroom presentations that are offered include:

- K-2nd grades: The water system and the people who build it. Students will help “build” a demonstration water system with pipes and see pictures of the people in their community and equipment and facilities that bring water to their homes and school. Students receive stickers and coloring books to follow up the lessons.
- 3rd grade: Drought tolerant plants, adapted for survival. Students examine drought tolerant plant adaptations, rainfall patterns around the world and learn about saving water by planting native and drought tolerant plants. California Poppy seeds and water-smart bookmarks are provided to the students at the end of the presentation.
- 4th grade: California's water. Students make a California rainfall map and learn how water is collected and transported around the state through aqueducts. Students brainstorm ideas on how to conserve water. Each student receives a water drop sponge.
- 5th grade: Our local water resources. Students go on a 1.5 hour field trip to a local well. Most wells are within walking distance or a short drive from the schools. Students learn about groundwater supplies and the water distribution system. Each student receives a globe ball and *Our Water Works in Santa Cruz County*, an activity book about our local water resources.
- 6th grade - 8th grade: Getting groundwater. Students pump water from the groundwater model to learn about aquifers and how we get water and clean it. Students learn how to calculate flow from the tap to understand how much water we use and how to use less. Each student receives a water conservation ruler or sponge.
- High School presentations: Our local water supply and demand. Students learn about how our community strives to balance water supply and demand by planning for future water needs and conserving water today. Water conservation magnets and *Careers in the Water Industry* pamphlets are provided.

Additionally, the following water education resources are available to schools in SqCWD:

- Water education activity booklets: Grade specific (K-12th grade) water education activity booklets are available to students. *Our Water Works in Santa Cruz County* 5th and 6th grade activity booklet: In partnership with other water agencies, the SqCWD developed a bilingual local water resource guide book. The booklet is offered to classrooms free-of-charge and provided to students who participate in a well field trip or classroom presentation.
- Stickers or pencils: Colorful stickers with water-wise messages are available for lower elementary students and pencils are available for upper elementary classes.
- Water education videos: Water education videos and DVDs are available on loan to teachers. Classroom-appropriate videos are available for most grade levels.
- Free water education shows for upper elementary: Water conservation assembly shows are presented by ZunZun or Earthcapades. Each school can choose one group annually.
- School poster contest: In recognition of May as Water Awareness Month, the SqCWD holds an annual “How I Save Water” poster contest for 4th and 5th grade students. Participants are asked to create a colorful drawing and slogan that tells people why water is so important and how they can conserve it. Posters are on display in the art halls during the summer months.
- *Project WET (Water Education for Teachers)* curriculum workshops: Teachers who attend the annual WET curriculum workshop learn how to use the national *Project WET water education activity guide book*, *Our Water Works in Santa Cruz County* activity booklet, and the *Watershed Cruzin’ Curriculum* from the Santa Cruz County Resource Conservation District. The District currently conducts one WET training session annually.
- Incredible Water Journey: Art is used as a vehicle to promote understanding of water conservation. This is a six class series presented to 4th and 5th-grade students that is taught in partnership with a local artist. This 4th and 5th grade joint science and art education program that started in 2004 is currently on hold due to budget and staff constraints.
- Water-Wise Class Retrofit Program: SqCWD has funded a program to bring the water-wise Resource Action Program retrofit kits to two 6th grade classes per year. The program is currently on hold due to budget constraints.
- Santa Cruz County Fair: In partnership with the Water Conservation Coalition, a water education booth with a game wheel or kid friendly water conservation activity is hosted on education days at the Santa Cruz County Fair in September.

**Implementation Schedule:** The SqCWD will continue to implement this DMM, although some programs may be modified or removed and others added as necessary in an effort to continually improve school education programs.

**Methods to Evaluate Effectiveness:** The SqCWD will continue to survey the educators on the number of programs, the quality and applicability of the materials, and attendance and participation at water conservation events.

**Conservation Savings:** The SqCWD has no method to quantify the savings associated with this DMM, but believes that this program continues to raise youth awareness about water supply and water conservation issues.

**Effect of Water Savings on SqCWD's Ability to Further Reduce Demand:** The water savings achieved from this DMM is believed to have a positive effect on SqCWD's ability to reduce demand.

## **I. DMM I – Conservation Programs for Commercial, Industrial, and Institutional Accounts**

**Status:** The SqCWD commercial, industrial and institutional (CII) sector has been targeted for water conservation since late 2003. Approximately five percent of the SqCWD's total connections consist of CII accounts, of which commercial accounts comprise the majority. Commercial water use accounts for about 13 percent of total water used within the service area, whereas institutional use accounts for about two percent of the total water used. The predominant types of commercial accounts include office space, retail, food service and lodging. There are no industrial accounts within the SqCWD service area.

**Implementation Description:** During the initial phase of this program, the top 20 percent of CII water users were either sent letters or contacted by telephone and offered a free interior and/or exterior survey and incentives sufficient to achieve customer implementation of survey findings. This service has since been expanded to all CII customers. Site-specific surveys are an efficient way to lower water use in this category.

The SqCWD offers a free interior and exterior survey to all CII customers. During the interior inspection, SqCWD staff produces a customized report that describes fixture inspections, leak tests, and water-saving retrofit opportunities for each site. A key goal of the exterior survey is to establish an efficient landscape watering schedule. A water survey using techniques similar to those used in the Large Landscape Conservation Program is performed at each site. The surveyor explains the recommended irrigation schedule to the facility manager or the site's professional landscape contractor. In addition, the facility manager is provided information about new irrigation technology and low-water-use landscaping for use in possible retrofitting projects.

The SqCWD also partners with the Monterey Bay Area Green Business Program in Santa Cruz County to assist, recognize and promote businesses that choose to participate in the Program. The Green Business Program is an incentives-based program designed to encourage businesses to meet or exceed environmental standards. Water efficiency specifications for fixtures and appliances, water conserving cleaning methods, and both indoor and outdoor requirements to prevent

water waste have been factored into the list of criteria that businesses must meet in order to receive certification under the Green Business Program. Additionally, in 2004, SqCWD partnered with a local nonprofit (Ecology Action) to provide free high-efficiency pre-rinse spray valves (PRSVs) to restaurants in the SqCWD service area.

**Implementation Schedule:** Since 2003, SqCWD has conducted approximately 35 commercial and institutional surveys, independent of the surveys conducted for the WDO Program. SqCWD has focused CII survey efforts on customers who have water use in the top 20 percent of all CII accounts. The targeted CII customers are contacted (via letters, email or telephone) and offered free surveys and conservation incentives where applicable. Free surveys are also offered to CII customers in response to uncharacteristically high water use, or upon customer request. In the future, SqCWD is planning on performing more detailed surveys within the predominant business categories that fall under the CII sector (e.g., food service, lodging, etc.) as they likely comprise the majority of CII water use. SqCWD will also continue to partner with the Green Business Program.

**Methods to Evaluate Effectiveness:** The SqCWD will continue to use CII feedback information from participating businesses to determine the effectiveness of this program. CII customers whose water use increases over time after receiving a survey will trigger revisits.

**Conservation Savings:** Site-specific conservation savings resulting from this DMM have not been evaluated to date. It is very difficult to determine an average water savings associated with CII surveys on a per survey basis due to the large variation in commercial operations. However, independent of toilet rebates and retrofits which are addressed under other DMMs, it is estimated that each CII survey within the service area saves 3-5 percent of the total water used by the customer. The savings are attributed to reducing water pressure, installing faucet aerators, and educating customers about how to read their meters.

Many of the toilets in the CII sector have been replaced and the vast majority (at least 95 percent) of PRSVs were replaced with high-efficiency PRSVs in most all restaurants within the SqCWD service area.

**Effect of Water Savings on SqCWD's Ability to Further Reduce Demand:** The conservation savings achieved from this DMM are believed to have a minor impact on SqCWD's ability to further reduce demand. It is anticipated that additional savings can be achieved with a renewed CII survey effort.

## **J. DMM J – Wholesale Agency Programs**

**Status:** This DMM is not applicable as SqCWD is not a wholesale water supplier.

## **K. DMM K – Conservation Pricing**

**Status:** As discussed above under DMM D, all connections to the SqCWD distribution system are metered. SqCWD currently bills customers on a bi-monthly basis. Bills include a flat rate service charge based on meter size, and a variable tiered water quantity rate based on actual consumption. The water quantity rate has been in place since 1999 for single-family residential accounts, although the structure and rates have changed over the years. Single-family water use accounts for about 60 percent of the SqCWD's total water usage and approximately 80 percent of SqCWD's total connections.

**Implementation Description:** In 1999, a two-tier pricing structure was implemented with the first tier consisting of 50 units (one unit equals 748 gallons) or less, and the second tier for 51 units or more per two-month billing period.

In January 2005, the first tier was lowered from 50 units or less to 35 units or less per two-month billing period. A conservation-based tiered rate structure was also instituted at this time for single-family residential customers with 3/4-inch and 1-inch meters.

In March 2008, SqCWD adopted a three-tiered pricing structure for all single-family residential customers. In 2009, the SqCWD Board of Directors approved a series of rate increases for the three-year period of 2010 through 2012. The three-tiered pricing structure is still in place and 2011 rates are as follows for 5/8-inch domestic meters:

- 1-8 units at \$3.22/unit
- 9-30 units at \$6.15/unit
- 31 units and above at \$10.65/unit

The rates for domestic 3/4-inch and larger residential meters are the same; however, the bi-monthly service charge is more for meters larger than 5/8-inch and the thresholds for the tiers are set at 1-13 units, 14-49 units and 50 units and above.

Single-family residential rates are scheduled to increase in 2012 by approximately eight percent and will likely continue to increase thereafter, although the rate of increase is not currently known. The conservation-based tiered rate structure provides an incentive for high-use single-family residential customers to evaluate their usage and determine whether there are opportunities to save water.

Multifamily residential customers, as well as commercial and institutional customers, are currently billed a flat rate of \$5.07/unit of water. This rate will increase to \$5.53/unit in 2012. In the future, the SqCWD may consider implementing a tiered-rate pricing structure for multifamily and CII customers; however, there are several barriers and issues to consider. Although multifamily housing constructed after 2003 was required to meter each unit individually,

multifamily housing constructed prior to 2003 is typically served by one meter. To accurately and fairly bill each unit for their proportional water use, property owners would need to install, monitor and maintain submeters. However, in some cases, it may not be possible to install submeters, and in others it may be cost prohibitive. Multifamily customers represent approximately 20 percent of the total residential water usage, about 15 percent of the total overall system usage, and approximately five percent of the SqCWD's total service connections.

It is also difficult to establish a tiered-rate pricing structure for the commercial and institutional customer sectors due to the varied uses of water. These accounts represent approximately 5 percent of the total service connections and account for about 15 percent of the total overall system water usage.

**Implementation Schedule:** SqCWD currently plans to continue conservation pricing, and as previously discussed, will implement additional rate increases in 2012 that were previously approved by the SqCWD Board of Directors. Applying tiered rates to the master-metered multifamily complexes and CII entities will be evaluated within one year.

**Methods to Evaluate Effectiveness:** The SqCWD has compared usage to pre- and post-tiered rate implementation and subsequent price adjustments in order to evaluate the effectiveness of rates on promoting conservation. However, this analysis is complex to perform because additional factors (e.g., weather, technology, social and political pressures, etc.) can also contribute to a decrease in water use, and these factors are hard to separate. Although difficult to separate out various factors, it is likely that conservation rates have played a moderate to significant part in declining water use within the SqCWD service area.

**Conservation Savings:** The purpose of this DMM is to decrease the customer's water use through price incentives as described above. The water savings due to the tiered rate structure are difficult to derive, but the current structure is designed to encourage the single-family residential customers using more than 8 units or 30 units bi-monthly to lower their water use. Staff estimates that in general for every 10% increase in rates, a 1% decrease in consumption occurs for the SqCWD.

**Effect of Water Savings on SqCWD's Ability to Further Reduce Demand:** The effects of any water savings associated with this DMM to date are expected to have a moderate effect on SqCWD's ability to reduce future demand. Reports have shown that after a certain level of conservation, the impacts of promoting conservation from a tiered pricing structure are significantly lessened. This "hardening" point usually occurs when customers have implemented the common indoor and outdoor water efficiency measures.

## **L. DMM L – Water Conservation Coordinator**

**Status:** The position of Water Conservation Coordinator was first filled in 1998 and will continue to be staffed for the foreseeable future, although the job title has changed and the duties have been expanded.

**Implementation Description:** Since the 2005 UWMP, the title for this position changed to Conservation and Customer Service Field Manager (CCSFM). The CCSFM reports directly to the General Manager and is responsible for the following tasks: Planning and managing the water conservation program; planning for and managing the Customer Service Field Department; and establishing and tracking the budget for both Conservation and Customer Service Field Departments. The Customer Service Field Department is responsible for installing new automatic meter reading technology in accordance with an installation plan and schedule for the service area, maintaining, repairing and reading meters, evaluating meter data logs to identify causes of excessive or unusual water usage, and responding to customer service requests. The CCSFM supervises 4 full-time Customer Service Field personnel.

The CCSFM also supervises the following Conservation staff: A part-time Water Education and Special Projects Assistant (hired in 2001 to coordinate community outreach and conservation education programs); a full-time Water Conservation Specialist (hired in 2003 to perform residential and commercial surveys); and a part-time Staff Analyst (hired in 2010 to assist with the conservation program).

**Implementation Schedule:** The SqCWD will continue to implement this DMM.

**Methods to Evaluate Effectiveness:** The SqCWD will continue to survey customers, institutions and educators on the effectiveness of conservation programs and materials.

**Conservation Savings:** The SqCWD has no method to quantify the specific savings of this DMM, but believes that this position is in the public's interest and necessary to the overall success of the conservation program.

**Effect of Water Savings on SqCWD's Ability to Further Reduce Demand:** The water savings achieved from this DMM is believed to have a positive effect on SqCWD's ability to reduce future demand. Successful conservation programs require prioritization to achieve cost-effective results, thoughtful design, organized implementation, and continual maintenance and feedback. This level of detail requires a dedicated Water Conservation Coordinator and adequate staffing.

## **M. DMM M – Water Waste Prohibition**

**Status:** The SqCWD adopted a water waste resolution in 1981 that prohibited certain wasteful uses of water and established SqCWD's authority to restrict or disconnect service for chronic violators. The 1981 resolution was rescinded in 2006 and replaced with a revised version. In December 2010, the 2006 resolution was rescinded and replaced with Water Waste Prohibition Ordinance 10-03 which includes changes that were needed to better help protect the District's water supply and to avoid or minimize the effects of groundwater overdraft, seawater intrusion and drought. Additionally, the Water Waste Prohibition Ordinance gives SqCWD the flexibility to issue fines or jail time (upon conviction) instead of, or in addition to, restricting or disconnecting water service for chronic violators. This is preferable in situations where multiple customers are served by one connection (yet not all customers are in violation), or where water service cannot be restricted or disconnected due to health and safety considerations.

**Implementation Description:** The Water Waste Prohibition Ordinance is enforced by SqCWD's Water Efficiency Enforcement Patrol (WEEP), as well as by the SqCWD Water Conservation Specialist and Customer Service Field personnel during the course of their normal work day. The WEEP was initiated during the 2009 irrigation season in which SqCWD customers were asked to participate in a voluntary 15 percent curtailment. Initially, the staff member assigned to the WEEP would select portions of the service area to actively check during the early morning peak irrigation hours. If a water waste violation was observed, an attempt was made to personally contact the property owner or occupant. Additionally, a letter was sent to the account holder to inform them of the violation and request corrective action. If the violation continued, up to two additional letters were sent to the account holder, after which the SqCWD would elect to restrict or disconnect water service until the situation was resolved.

The frequency of the WEEP has been reduced during the 2011 irrigation season in that staff is not actively checking select areas during early morning hours. Instead, the Water Conservation Specialist routinely looks for water waste violations while traveling to and from survey appointments and other customer service calls. Additionally, SqCWD Customer Service Field personnel routinely look for water waste during the course of their normal work day. SqCWD also receives and responds to calls from customers and the general public about specific water waste incidents. The most common violation observed during the WEEP is over-irrigation and runoff of water.

Under the Water Waste Prohibition Ordinance, violations are enforced through a three-step process. For the first violation, the SqCWD issues a written warning to the offender. If the first violation is not corrected within the time frame specified by the SqCWD (at least 24 hours), the SqCWD may issue a second written warning. If the second violation is not corrected within the time frame specified by SqCWD (at

least 24 hours), the SqCWD may impose any or all of the following penalties: (1) restrict or disconnect water service; (2) issue a fine up to \$600 (upon conviction); and (3) impose imprisonment in the county jail for not more than 30 days (upon conviction).

SqCWD sought to actively involve customers in the drafting of the Water Waste Prohibition Ordinance by providing public notice, requesting public comments, holding a public hearing and seeking press coverage prior to Ordinance adoption. Additionally, the key provisions of the adopted Ordinance were included in an article published in the SqCWD's bimonthly newsletter that is sent with billing statements.

While the Water Waste Prohibition Ordinance addresses existing development and wasteful uses of water, SqCWD also has indoor and outdoor water use efficiency ordinances in place for all new development (and modifications to certain existing development). Ordinance 10-01 requires that all indoor plumbing fixtures meet minimum efficiency requirements. Ordinance 10-02 requires that all landscapes are developed in accordance with a set of minimum water use efficiency requirements that parallel the State Landscape Model Ordinance. These Ordinances are discussed below in more detail under "Additional Demand Management Measures".

**Implementation Schedule:** The Water Waste Prohibition Ordinance was adopted by the SqCWD Board of Directors in December 2010, and is anticipated to remain in effect over the long term.

**Methods to Evaluate Effectiveness:** SqCWD does not have a method to evaluate the effectiveness of the Water Waste Prohibition Ordinance in regards to water savings. However, it is assumed that any contact with the community raises water conservation awareness. Additionally, the development of a formal system for notifying customers and a clear enforcement process appears to result in a quicker corrective response time from customers, and may prevent future instances of water waste.

**Conservation Savings:** The SqCWD has no method to quantify savings that may be associated with this DMM, but believes that the educational element of this DMM is of great value to customers.

**Effect of Water Savings on SqCWD's Ability to Further Reduce Demand:** The effects of any water savings associated with implementation of this DMM on the ability of the SqCWD to further reduce demand are believed to be minor.

## **N. DMM N - Residential Ultra-low-flush Toilet Replacement Programs**

This DMM consists of two components: a toilet rebate program and a direct toilet installation program.

**Rebate Program Status:** The SqCWD Ultra-Low-Flush Toilet (ULFT) rebate program was initiated in 1997 for both residential and commercial customers and is still ongoing; however, rebate amounts and qualifying criteria have changed over the years. Under the current program, SqCWD offers both residential and commercial customers a \$150 rebate to replace a high-water use toilet (i.e., one that uses 3.5 gallons per flush (gpf) or more) with a High Efficiency Toilet (HET) that uses 1.28 gpf or less.

**Direct Installation Program Status:** In 2003, the SqCWD initiated a free toilet replacement and installation program for residential and commercial customers as part of the Water Demand Offset (WDO) program. The WDO program requires developers to offset projected water use associated with any new development by 120 percent. When the program started, developers were directly responsible for replacing high-flow toilets with an equivalent number of ULFTs needed to equal their required offset amount. Developers were able to locate their own retrofits, or they could work from a list of program participants provided by SqCWD.

In 2009, SqCWD modified the program to charge developers an upfront WDO fee for their proposed development and hiring a dedicated plumbing contractor to purchase and install the corresponding number of toilets to offset the new development. The WDO toilet replacement program was completed in 2010 and a total of approximately 3,450 high-water use toilets were replaced. This program is discussed below in more detail under “Additional Demand Management Measures”.

**Rebate Program Implementation Description:** The SqCWD first established a high visibility ULFT rebate program in 1997. The program offered a \$75 credit to existing residential customers who replaced their high-water-use toilets with ULFTs that used 1.6 gallons per flush (gpf).

In April of 2007, the SqCWD changed the water use efficiency rebate criteria for toilets from ULFTs that use 1.6 gpf or less to HETs that use 1.28 gpf or less. At this time, rebates of \$250 were provided for replacement of high-water use toilets with HETs. In July 2010, the rebate amount for HETs was lowered to \$150 as the number of qualifying toilets has increased and the retail price of qualifying toilets has decreased. SqCWD is considering revising its toilet replacement program in 2011 to incorporate the newly available Ultra-High Efficiency Toilets (UHETs) that use less than 1.0 gpf.

The current toilet rebate program works as follows:

- After purchasing a toilet that meets SqCWD’s criteria, the customer submits an Indoor Rebate Application and the original dated sales receipt to SqCWD.
- If requested by SqCWD staff, the customer must allow staff to conduct an on-site inspection as a condition of rebate approval.

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- After SqCWD approval, the rebate appears as a credit on the customer's water bill or, under special circumstances a check is sent directly to the applicant.

The overall goal of the toilet rebate program is to replace approximately 85 percent of the existing residential toilets with ULFTs (and later with HETs). An analysis is needed to accurately determine the approximate percentage of toilets that have been replaced within the service area.

**Direct Installation Program Implementation Description:** For the direct toilet installation program, developers could locate their own retrofits, or could work from a list of program participants to replace the number of toilets that would satisfy their specific offset requirements. The developer was required to purchase the new toilets, schedule installation with the customers, and install the toilets. However, development eventually declined and many customers who had signed up for the program were experiencing long waits to receive their free toilet(s). In order to alleviate the toilet replacement backlog, the program was modified in 2009. At this time, SqCWD instituted an upfront WDO fee for all new development, which was used by SqCWD to purchase HETs and hire a plumber dedicated to completing the required number of toilet installations. The direct toilet installation program was completed in 2010.

**Rebate Program Implementation Schedule:** As shown in **Table 6-4**, approximately 4,700 toilet rebates have been issued since 1997. About 75 percent of the total rebates were issued from 1997 – 2007 for ULFTs. The remaining 25 percent were issued from 2006 – 2010 for HETs. Approximately 95 percent of the rebates were issued to residential customers, with commercial and institutional customers receiving the remaining five percent.

**Table 6-4** shows the historical ULFT schedule, the historical and projected HET schedule, annual water savings and 1997-2010 total water savings associated with the toilet rebate program.

Table 6-4 DMM N: Toilet Replacement/Rebate Program <sup>a</sup>			
Year	Number of ULFT Rebates	Number of HET Rebates	Annual Water Savings (acre-feet) <sup>b</sup>
1997	181		4.2
1998	347		8.0
1999	346		8.0
2000	192		4.4
2001	253		5.8
2002	304		7.0
2003	376		8.6
2004	566		13.0
2005	492		11.3
2006	380	8	9.0
2007	54	216	7.3
2008		336	9.4
2009		276	7.7
2010		360	10.1
<b>1997–2010 Total</b>	<b>3,491</b>	<b>1,196</b>	<b>113.8</b>
<i>2011 (projected)</i>		<i>228</i>	<i>6.4</i>
<i>2012e</i>		<i>209</i>	<i>5.9</i>
<i>2013e</i>		<i>200</i>	<i>5.6</i>
<i>2014e</i>		<i>192</i>	<i>5.4</i>
<i>2015e</i>		<i>188</i>	<i>5.3</i>
<i>e</i> = estimate			

Footnote:

<sup>a</sup> Approximately five percent of the rebates were issued to commercial and institutional customers; the remaining 95 percent were for residential customers.

<sup>b</sup> Each replacement of a 3.5 gpf residential toilet with an ULFT saves approximately 0.023 acre-feet/year, and each replacement of a 3.5 gpf residential toilet with a HET saves about 0.028 acre-feet/year.

**Direct Installation Program Implementation Schedule:** Table 6-5 shows the historical schedule, annual water savings and total water savings from direct toilet installations completed under the WDO program. The WDO toilet replacement program was completed in 2010. The majority of toilets replaced under this program were within CII sector.

Table 6-5 DMM N: Toilet Replacement/Direct Installation Program			
Year	Number of Replacements with ULFT's	Number of Replacements with HET's	Annual Water Savings (acre-feet) <sup>a</sup>
2003	11		0.39
2004	353		12.4
2005	831		29.1
2006	415		14.5
2007		306	12.9
2008		939	39.4
2009		181	7.6
2010		416	17.5
<b>2003-2010 Total</b>	<b>1,610</b>	<b>1,842</b>	<b>133.8</b>
<i>e</i> = estimated			

Footnote:

<sup>a</sup>Each replacement of a 3.5 gpf toilet with an ULFT saves approximately 0.035 acre-feet/year, and each replacement of a 3.5 gpf toilet with a HET saves about 0.042 acre-feet/year.

**Rebate Program Conservation Savings:** Conservation literature and staff estimates indicate that replacement of a 3.5 gpf residential toilet with an ULFT is assumed to save approximately 25 gallons per day per household or 0.023 afy. Replacement of a 3.5 gpf residential toilet with a HET is estimated to save 30 gallons per day per household, or 0.028 afy. As shown in **Table 6-4**, total water savings from the toilet rebate program from 1997-2010 are estimated to be approximately 114 acre-feet.

**Direct Installation Program Conservation Savings:** Conservation literature and staff estimates indicate that replacement of a commercial 3.5 gpf toilet with an ULFT is assumed to save 0.035 afy, and replacement of a commercial 3.5 gpf toilet with a HET is estimated to save 0.042 afy. Direct toilet installation under the WDO program saved approximately 134 acre-feet of water as shown in **Table 6-5**.

**Effect of Water Savings on SqCWD's Ability to Further Reduce Demand:** The effects of the water savings resulting from implementation of both the toilet rebate and direct installation programs over the last 13 years are expected to have a significant effect on the ability of the SqCWD to further reduce demand. Further reductions in water use can be achieved only by retrofitting the remaining high-water use toilets, or by replacing 1.6 gpf ULFTs with the new UHETs that use 0.8 or less gpf. However, the margin of return associated with this DMM is decreasing.

Within the next five years, SqCWD plans to conduct a study to determine the degree of market saturation for ULFTs/HETs/UHETs. The findings of this study may result in further changes in the scope or focus of the toilet rebate program.

### **Additional Demand Management Measures**

Provided below are brief descriptions of water demand management measures that SqCWD implements beyond those required to be addressed in the UWMP and prescribed by California Urban Water Conservation Council (CUWCC). Although these additional measures are not required to be discussed in the UWMP, they are included to provide a more complete picture of SqCWD's conservation efforts.

#### **Water Demand Offset Policy**

In 2003, the SqCWD Board of Directors adopted the "Water Demand Offset (WDO) Policy" that requires new development to "offset" its projected water use by 120 percent. The projected water use is based on the end use and size of the proposed development. The purpose of the WDO Policy is to prevent having to declare a building moratorium and avoid exacerbating the existing groundwater overdraft situation until a sufficient supplemental supply becomes available. The WDO requirements are met by retrofitting high-water use devices (e.g., toilets, urinals, faucets, etc.) in existing development with lower-water use devices. This was established as an interim program for the reasons listed above and, according to current policy, will be discontinued once sufficient water supply is available or earlier should the number of available offset credits dwindle.

As previously discussed above under DMM N, the WDO program initially began with developers purchasing and installing the retrofit fixtures. Developers were able to locate their own retrofits, or work off a list of SqCWD customers who had signed-up to receive free low-flow toilets. When local development began to decline at the start of the economic recession, there was still a lengthy list of customers waiting for their free toilets. In order to alleviate this backlog, the program was modified in 2009. At this time, SqCWD instituted an upfront WDO fee (currently at \$18,000 per acre-foot) for all new development, which was used by SqCWD to purchase the HETs and hire a plumber dedicated to completing the required number of toilet installations. The direct toilet installation program was completed in 2010. Approximately 3,450 high-water use toilets were replaced with ULFTs or HETs. Toilet retrofits comprised the majority of the total 146 acre-feet that were saved by implementing this program. The remainder of the savings was primarily from urinal, showerhead and faucet retrofits.

An off-shoot of the WDO program is SqCWD's Go Green program which allows developers to reduce their required offsets by doing more than what is required by SqCWD for water efficient fixtures, appliances, devices, and landscapes. Developers participating in this program may apply to receive SqCWD-specified credit reductions for various high-efficiency measures in residential development, or may propose credit reductions for commercial development based on the estimated water

saving potential of the measure. Under the Go Green program, developers must first agree to install Ultra High-Efficiency Toilets (UHETs) before receiving credit for additional measures. Via the Go Green program, developers can reduce their water usage by up to approximately 15%. Upon completion of new development and installation of measures qualifying for offset credit, SqCWD staff conducts a compliance inspection to verify installation of applicable measures.

### **Water Use Efficiency Requirements**

The SqCWD first passed a landscape conservation resolution in 1979 to incorporate reasonable water conservation techniques in all new development. The landscape resolution was revised in 2004, and indoor water use efficiency requirements (WUER's) were added at this time. In 2010, the existing resolution was rescinded and two Water Use Efficiency Ordinances were adopted by the SqCWD Board of Directors.

Ordinance 10-01 for indoor water use applies to all new development requiring new water service, as well as certain existing development (i.e., changes in use resulting in increased water use, remodels of kitchens and/or bathrooms that required building permits, and upgrades to meters). All developers subject to Ordinance 10-01 must complete and submit an Indoor Water Use Efficiency Checklist to verify that they comply with minimum SqCWD efficiency requirements.

Ordinance 10-02 for outdoor water use applies to all new development, as well as existing landscapes undergoing renovation in accordance with a building permit. Although SqCWD was not required to adopt the State Landscape Model Ordinance, the water use efficiency requirements in Ordinance 10-02 parallel, and in some cases are more stringent than, the State Ordinance. Additionally, SqCWD Ordinance 10-02 applies to all development as opposed to development where landscape exceeds designated thresholds. For instance, single-family residential development on parcels less than 10,000 square feet (defined as Tier I Single-Family Development) is required to meet basic landscape conservation requirements and to submit a Tier I Outdoor Water Use Efficiency Checklist indicating compliance with each specific requirement. Single-family development on parcels 10,000 square feet or larger (defined as Tier II Single-Family Development), as well as all multifamily and CII development is subject to a more stringent set of landscape conservation requirements and must submit a completed Landscape Project Application Plan.

### **Retrofit on Resale**

This program tracks and enforces compliance with the City of Capitola and County of Santa Cruz Codes that require replacement of high-water use toilets, urinals and showerheads when a property changes ownership. Unless responsibility is legally transferred to and assumed by the buyer, the seller must certify that toilets use 1.6 gpf or less; urinals use 1.0 gpf or less; and showerheads use 2.5 gpm or less. SqCWD is currently working with these agencies to revise the current efficiency requirements to incorporate even more efficient and readily available fixtures. For

instance, toilets would need to use 1.28 gpf or less; urinals would need to use 0.5 gpf or less; and showerheads would need to use 2.0 gpm or less.

In 2004, SqCWD began tracking retrofit on resale compliance in portions of the City of Capitola located within the service area. In September 2005, the SqCWD Board of Directors voted to track and enforce the retrofit on resale program throughout the remainder of its service area that was previously monitored by the County of Santa Cruz.

Compliance with these codes within the SqCWD service area is monitored by SqCWD with a software system that tracks property sales and compares them with submittal of retrofitted compliance forms that realtors provide to their clients. If a compliance form has not been submitted for a given property sale, SqCWD will send out a letter requesting compliance within a given timeframe. If corrective action is not taken by the new property owner, SqCWD may record a violation on the property title. SqCWD staff also performs on-site inspections to verify that the required retrofits have been performed.

#### **Weather-Based Controller Program**

In 2003, SqCWD started a pilot program to evaluate weather-based irrigation controllers and installed and tested the devices for over a year at 10 sites (mostly large landscapes, but also at a few residential sites). The results showed approximately 20 percent landscape water savings. In 2005, Bureau of Reclamation awarded SqCWD a matching grant for a total of \$218,790 to install up to 325 weather-based devices. Between 2006 and 2007, approximately two-hundred controllers were installed at commercial and residential landscape sites with dedicated irrigation meters. A small number of controllers were returned or replaced by the recipient, leaving about 175 performing in the field. The average water savings per controller is about 0.12 af per year and the total savings from this program is estimated at 20 afy.

#### **Turf Replacement Rebate**

In 2004, SqCWD started a rebate credit program for customers who replaced existing lawn with synthetic turf. The rebate amount was \$1 per square foot with a maximum of \$300. In 2008, the turf rebate program was revised to allow for the replacement of high-water use turf with low-water use turf and plants or synthetic turf at an amount of \$2 per square foot. The program was subsequently put on-hold in early 2009 after the funding had expired. In July 2010, SqCWD was able to offer the turf rebate again, but at a rebate amount of \$1 per square foot for the replacement of high-water use turf with low-water use turf, low-water use plants, or synthetic turf. The current maximum rebate amount is \$1,000 for single-family homes and \$3,000 for larger areas such as commercial and multi-family housing landscapes. To date, 152 rebates have been approved and approximately 189,000 square feet of high-water use turf has been replaced. The estimated water savings resulting from implementation of this program is 9.8 acre-feet.

### **Additional Rebates**

In addition to previously discussed rebate credits for toilets, clothes washing machines and turf replacement, SqCWD also offers rebate credits for the following:

- Self-activated or timer-controlled hot water recirculation systems (\$75);
- Graywater systems (\$75 per qualifying connection including laundry, bath and/or shower, or bathroom sink to landscape, up to \$225);
- Rain catchment systems (\$25 for rain barrels between 40 and 200 gallons, and \$25 per 100 gallons of storage for containers larger than 200 gallons, up to a maximum of \$750 for 3,000 gallons);
- Weather-based irrigation controllers (\$75-\$125),
- Irrigation parts (\$5 per replaced sprinkler head, up to a maximum of \$50 for residential and \$250 for larger sites); and
- Drip irrigation retrofits (\$20 per square foot of area converted to drip).
- In 2004, the SqCWD started a rebate program for customers who replace existing urinals with waterless urinals. The rebate amount has been congruent with SqCWD's toilet rebate.

*Checklist Item #29. An evaluation of each water demand management measure listed in paragraph (1) of subdivision (f) that is not currently being implemented or scheduled for implementation. In the course of the evaluation, first consideration shall be given to water demand management measures, or combination of measures, that offer lower incremental costs than expanded or additional water supplies. This evaluation shall do all of the following: (1) Take into account economic and noneconomic factors, including environmental, social, health, customer impact, and technological factors; (2) Include a cost-benefit analysis, identifying total benefits and total costs; (3) Include a description of funding available to implement any planned water supply project that would provide water at a higher unit cost; (4) Include a description of the water supplier's legal authority to implement the measure and efforts to work with other relevant agencies to ensure the implementation of the measure and to share the cost of implementation (10631(g)).*

This item is not applicable. SqCWD has already implemented each of the 14 DMMs listed in paragraph (1) of subdivision (f) with the exception of DMM J which is not applicable.

## **Section 7: Climate Change**

### **Background**

California Assembly Bill 32 (AB 32) titled “The Global Warming Solutions Act of 2006” identifies climate change as posing a significant risk to the environment, public, and natural resources, and requires a statewide reduction of greenhouse gas (GHG) emissions to 1990 levels by 2020. In turn, these reduction requirements are passed on to the largest generators of GHGs within the energy production, construction, transportation and industrial sectors. As a consumer of energy, the mandatory emission reductions required under AB32 do not specifically apply to Soquel Creek Water District (SqCWD); however, proactively reducing energy consumption within our operations is an established District policy.

Additionally, although a discussion of potential climate change impacts to a water purveyor’s water supply and customer demand is not required in the 2010 UWMP, SqCWD recognizes that planning for the impacts of climate change is an increasingly important component of water planning.

A comprehensive planning strategy for climate change requires water managers to consider two different responses: mitigation and adaptation.

### **Mitigation**

Mitigation is the action of taking steps to reduce further contribution to climate change by reducing GHG emissions associated with the energy used to collect, treat and distribute water. GHG emissions generated during water production can be reduced by reducing energy use, increasing energy efficiency, and/or substituting renewable energy sources for fossil fuel based energy sources. SqCWD is actively committed to reducing energy use and GHGs from its operations and has implemented the following projects: (1) replaced fluorescent lighting throughout the office facilities with energy efficient Light-Emitting Diode (LED) lighting; and (2) replaced groundwater pump motors with premium efficiency motors in accordance with a phased schedule. Additionally, SqCWD has evaluated the replacement of gasoline-powered fleet vehicles at the end of their life-cycle with hybrid vehicles. SqCWD currently has one hybrid fleet vehicle and will incorporate additional “green” vehicles when appropriate.

SqCWD will continue to evaluate operational energy use associated with both current and future water production supplies and will seek strategies to reduce the use of non-renewable energy and decrease GHGs. As part of the evaluation for the seawater desalination project with the City of Santa Cruz, an Energy Minimization and Greenhouse Gas Reduction Study is being prepared to determine actions that could be taken to diminish the GHG impacts from this proposed new water supply.

Water conservation directly reduces energy consumption as a decrease in customer water demand translates into a decrease in energy requirements for water

production. SqCWD will continue its ambitious water conservation program that includes incentives for our customers to acquire high efficiency fixtures and appliances.

### **Adaptation**

Adaptation refers to the way in which water suppliers will need to change in order to minimize the effects of climate change. While there are many uncertainties regarding the effects of future climate change, there is significant evidence that climate change has already occurred in California. For instance, a 2008 report by the DWR states, *“The average early spring snowpack in the Sierra Nevada decreased by about 10 percent during the last century, a loss of 1.5 million acre-feet of snowpack storage . . . During the same period, sea level rose seven inches along California’s coast. California’s temperature has risen 1° F, mostly at night and during the winter, with higher elevations experiencing the highest increase. . . . peak natural flows have increased on many of the State’s rivers during the last fifty years. At the other extreme, many Southern California cities have experienced their lowest recorded annual precipitation twice within the past decade. In a span of only two years, Los Angeles experienced both its driest and wettest years on record.”*

As SqCWD’s water supply, and that of the County of Santa Cruz as a whole, is locally derived and does not depend upon large federal and state water projects, climate change patterns related to reduced snowpack and changes in snowpack runoff (i.e., more winter runoff and less spring/summer runoff) will not have an impact on local supplies. However, changes in the magnitude, pattern, and rate of change related to rainfall intensity, sea level rise and temperature are of significant concern to our local water supply.

In regards to rainfall, climate change forecasts indicate an increase in the intensity of storms, potentially leading to higher runoff and less recharge of groundwater basins. Preliminary work being done by the United States Geological Survey for Santa Cruz County suggests rainfall within the Soquel-Aptos area may range from 2 to 24 percent less, and that groundwater recharge may range from 10 to 37 percent less in the future (John Ricker, personal communication, April 27, 2011). Decreases in rainfall could result in increased usage for irrigation, and a decline in groundwater recharge in the Soquel-Aptos area would exacerbate existing overdraft.

The potential decline in recharge rates, coupled with predicted rises in sea level, are especially of concern to the viability of SqCWD’s water supply. In addition to increasing the threat of coastal flooding from tidal surges, sea-level rise could increase the risk and extent of seawater intrusion as increased pressure from rising seawater pushes the freshwater/seawater transition zone inland at an increased rate. As indicated in the 2009 California Climate Change Adaptation Strategy (California Natural Resources Agency), sea level is projected to rise by as much as 20 to 55 inches along the California coast by the end of this century.

Lastly, increases in temperature would increase plant evapotranspiration and lead to greater water demand. A 2006 report by the California Climate Change Center indicates that temperatures in California are projected to increase by at least 3 degrees Fahrenheit up to 10.5 degrees Fahrenheit, depending upon the rate of future greenhouse gas emissions.

The following SqCWD programs will facilitate our ability to adapt to anticipated climate change impacts:

- The Well Master Plan identifies five new wells located further inland from existing wells to redistribute pumping away from the coast and retreat from any inland advance of the freshwater/seawater transition zone from sea-level rise.
- The potential seawater desalination facility could provide a reliable, sustainable source of water supply that could adapt to changing climate patterns.
- Implementation of conservation programs helps to minimize long-term water demand.

### **Conclusion**

As water planning has traditionally relied on historic climate patterns, water planners and managers will increasingly need to incorporate new tools and approaches to adapt to climate change. To prepare for these future challenges, SqCWD must continue to pursue a multi-phased adaptive approach by identifying strategies to mitigate GHG emissions associated with water production, reducing demand via conservation and reducing pressure on an overdrafted groundwater supply by developing supplemental sources of water. SqCWD will continue to refer to climate change planning guidance published by the California Department of Water Resources and others, and to incorporate this guidance into future water planning efforts.

## Section 8: Completed UWMP Checklist

**Table I-1 Urban Water Management Plan checklist, organized by legislation number**

No.	UWMP requirement <sup>a</sup>	Calif. Water Code reference	Subject <sup>b</sup>	Additional clarification	UWMP location
1	Provide baseline daily per capita water use, urban water use target, interim urban water use target, and compliance daily per capita water use, along with the bases for determining those estimates, including references to supporting data.	10608.20(e)	System Demands	Non-census year population estimate	Section 3, pg. 3-4 through 3- 8. Appendix K.
2	<i>Wholesalers:</i> Include an assessment of present and proposed future measures, programs, and policies to help achieve the water use reductions. <i>Retailers:</i> Conduct at least one public hearing that includes general discussion of the urban retail water supplier's implementation plan for complying with the Water Conservation Bill of 2009.	10608.36 10608.26(a)	System Demands	Retailer and wholesalers have slightly different requirements	Section 3, pg. 3-12 (retail). Wholesale not applicable Section 1 pg. 1-5.
3	Report progress in meeting urban water use targets using the standardized form.	10608.40	Not applicable	Standardized form not yet available	Not applicable until 2015
4	Each urban water supplier shall coordinate the preparation of its plan with other appropriate agencies in the area, including other water suppliers that share a common source, water management agencies, and relevant public agencies, to the extent practicable.	10620(d)(2)	Plan Preparation		Section 1, pg. 1-1 through 1-2. Table 1-1. Appendix A.
5	An urban water supplier shall describe in the plan water management tools and options used by that entity that will maximize resources and minimize the need to import water from other regions.	10620(f)	Water Supply Reliability . . .		Section 2, pg. 2-5 through 2-9. Section 5, pg. 5-2 through 5-3.
6	Every urban water supplier required to prepare a plan pursuant to this part shall, at least 60 days prior to the public hearing on the plan required by Section 10642, notify any city or county within which the supplier provides water supplies that the urban water supplier will be reviewing the plan and considering amendments or changes to the plan. The urban water supplier may consult with, and obtain comments from, any city or county that receives notice pursuant to this subdivision.	10621(b)	Plan Preparation		Section 1, pg. 1-3. Table 1-1. Appendix B.

**SqCWD 2010 UWMP**  
**Section 8: Completed UWMP Checklist**

No.	UWMP requirement <sup>a</sup>	Calif. Water Code reference	Subject <sup>b</sup>	Additional clarification	UWMP location
7	The amendments to, or changes in, the plan shall be adopted and filed in the manner set forth in Article 3 (commencing with Section 10640).	10621(c)	Plan Preparation		Section 1, pg. 1-6.
8	Describe the service area of the supplier	10631(a)	System Description		Section 2, pg. 2-1 through 2-5.
9	(Describe the service area) climate	10631(a)	System Description		Section 2, pg. 2-12. Table 2-1.
10	(Describe the service area) current and projected population . . . The projected population estimates shall be based upon data from the state, regional, or local service agency population projections within the service area of the urban water supplier . . .	10631(a)	System Description	Provide the most recent population data possible. Use the method described in "Baseline Daily Per Capita Water Use." See Section M.	Section 2, pg. 2-12 through 2-16. Table 2-2.
11	. . . (population projections) shall be in five-year increments to 20 years or as far as data is available.	10631(a)	System Description	2035 and 2040 can also be provided to support consistency with Water Supply Assessments and Written Verification of Water Supply documents.	Section 2, pg. 2-16.
12	Describe . . . other demographic factors affecting the supplier's water management planning	10631(a)	System Description		Section 2, pg. 2-16. Table 2-3.
13	Identify and quantify, to the extent practicable, the existing and planned sources of water available to the supplier over the same five-year increments described in subdivision (a).	10631(b)	System Supplies	The 'existing' water sources should be for the same year as the "current population" in line 10. 2035 and 2040 can also be provided to support consistency with Water Supply Assessments and Written Verification of Water Supply documents.	Section 4, pg. 4-1 through 4-5. Table 4-2.

**SqCWD 2010 UWMP**  
**Section 8: Completed UWMP Checklist**

No.	UWMP requirement <sup>a</sup>	Calif. Water Code reference	Subject <sup>b</sup>	Additional clarification	UWMP location
14	(Is) groundwater . . . identified as an existing or planned source of water available to the supplier . . . ?	10631(b)	System Supplies	Source classifications are: surface water, groundwater, recycled water, storm water, desalinated sea water, desalinated brackish groundwater, and other.	Section 4, pg. 4-6.
15	(Provide a) copy of any groundwater management plan adopted by the urban water supplier, including plans adopted pursuant to Part 2.75 (commencing with Section 10750), or any other specific authorization for groundwater management. Indicate whether a groundwater management plan been adopted by the water supplier or if there is any other specific authorization for groundwater management. Include a copy of the plan or authorization.	10631(b)(1)	System Supplies		Section 4, pg. 4-7. Appendix M.
16	(Provide a) description of any groundwater basin or basins from which the urban water supplier pumps groundwater.	10631(b)(2)	System Supplies		Section 4, pg. 4-7 through 4-8.
17	For those basins for which a court or the board has adjudicated the rights to pump groundwater, (provide) a copy of the order or decree adopted by the court or the board	10631(b)(2)	System Supplies		Section 4, pg. 4-8. Not applicable.
18	(Provide) a description of the amount of groundwater the urban water supplier has the legal right to pump under the order or decree.	10631(b)(2)	System Supplies		Section 4, pg. 4-8. Not applicable.
19	For basins that have not been adjudicated, (provide) information as to whether the department has identified the basin or basins as overdrafted or has projected that the basin will become overdrafted if present management conditions continue, in the most current official departmental bulletin that characterizes the condition of the groundwater basin, and a detailed description of the efforts being undertaken by the urban water supplier to eliminate the long-term overdraft condition.	10631(b)(2)	System Supplies		Section 4, pg. 4-8.

**SqCWD 2010 UWMP**  
**Section 8: Completed UWMP Checklist**

No.	UWMP requirement <sup>a</sup>	Calif. Water Code reference	Subject <sup>b</sup>	Additional clarification	UWMP location
20	(Provide a) detailed description and analysis of the location, amount, and sufficiency of groundwater pumped by the urban water supplier for the past five years. The description and analysis shall be based on information that is reasonably available, including, but not limited to, historic use records.	10631(b)(3)	System Supplies		Section 4, pg. 4-11. Table 4-3.
21	(Provide a) detailed description and analysis of the amount and location of groundwater that is projected to be pumped by the urban water supplier. The description and analysis shall be based on information that is reasonably available, including, but not limited to, historic use records.	10631(b)(4)	System Supplies	Provide projections for 2015, 2020, 2025, and 2030.	Section 4, pg. 4-12. Table 4-4.
22	Describe the reliability of the water supply and vulnerability to seasonal or climatic shortage, to the extent practicable, and provide data for each of the following: (A) An average water year, (B) A single dry water year, (C) Multiple dry water years.	10631(c)(1)	Water Supply Reliability...		Section 5, pg. 5-17 through 5-18. Tables 5-4 and 5-5.
23	For any water source that may not be available at a consistent level of use - given specific legal, environmental, water quality, or climatic factors - describe plans to supplement or replace that source with alternative sources or water demand management measures, to the extent practicable.	10631(c)(2)	Water Supply Reliability...		Section 5, pg. 5-3 through 5-5. Table 5-1.
24	Describe the opportunities for exchanges or transfers of water on a short-term or long-term basis.	10631(d)	System Supplies		Section 4, pg. 4-13 through 4-14. Table 4-5.
25	Quantify, to the extent records are available, past and current water use, and projected water use (over the same five-year increments described in subdivision (a)), identifying the uses among water use sectors, including, but not necessarily limited to, all of the following uses: (A) Single-family residential; (B) Multifamily; (C) Commercial; (D) Industrial; (E) Institutional and governmental; (F) Landscape; (G) Sales to other agencies; (H) Saline water intrusion barriers, groundwater recharge, or conjunctive use, or any combination thereof; (I) Agricultural.	10631(e)(1)	System Demands	Consider "past" to be 2005, present to be 2010, and projected to be 2015, 2020, 2025, and 2030. Provide numbers for each category for each of these years.	Section 3, pg. 3-8 through 3-9. Tables 3-4, 3-5, 3-6, 3-7, and 3-8.

**SqCWD 2010 UWMP**  
**Section 8: Completed UWMP Checklist**

No.	UWMP requirement <sup>a</sup>	Calif. Water Code reference	Subject <sup>b</sup>	Additional clarification	UWMP location
26	(Describe and provide a schedule of implementation for) each water demand management measure that is currently being implemented, or scheduled for implementation, including the steps necessary to implement any proposed measures, including, but not limited to, all of the following: (A) Water survey programs for single-family residential and multifamily residential customers; (B) Residential plumbing retrofit; (C) System water audits, leak detection, and repair; (D) Metering with commodity rates for all new connections and retrofit of existing connections; (E) Large landscape conservation programs and incentives; (F) High-efficiency washing machine rebate programs; (G) Public information programs; (H) School education programs; (I) Conservation programs for commercial, industrial, and institutional accounts; (J) Wholesale agency programs; (K) Conservation pricing; (L) Water conservation coordinator; (M) Water waste prohibition; (N) Residential ultra-low-flush toilet replacement programs.	10631(f)(1)	DMMs	Discuss each DMM, even if it is not currently or planned for implementation. Provide any appropriate schedules.	Section 6: DMM A p. 6-2 DMM B p. 6-5 DMM C p. 6-8 DMM D p. 6-9 DMM E p. 6-12 DMM F p. 6-14 DMM G p. 6-17 DMM H p. 6-20 DMM I p. 6-22 DMM J p. 6-23 DMM K p. 6-24 DMM L p. 6-26 DMM M p. 6-27 DMM N p. 6-28
27	A description of the methods, if any, that the supplier will use to evaluate the effectiveness of water demand management measures implemented or described under the plan.	10631(f)(3)	DMMs		Section 6 same as above.
28	An estimate, if available, of existing conservation savings on water use within the supplier's service area, and the effect of the savings on the supplier's ability to further reduce demand.	10631(f)(4)	DMMs		Section 6 same as above.

**SqCWD 2010 UWMP**  
**Section 8: Completed UWMP Checklist**

No.	UWMP requirement <sup>a</sup>	Calif. Water Code reference	Subject <sup>b</sup>	Additional clarification	UWMP location
29	An evaluation of each water demand management measure listed in paragraph (1) of subdivision (f) that is not currently being implemented or scheduled for implementation. In the course of the evaluation, first consideration shall be given to water demand management measures, or combination of measures, that offer lower incremental costs than expanded or additional water supplies. This evaluation shall do all of the following: (1) Take into account economic and noneconomic factors, including environmental, social, health, customer impact, and technological factors; (2) Include a cost-benefit analysis, identifying total benefits and total costs; (3) Include a description of funding available to implement any planned water supply project that would provide water at a higher unit cost; (4) Include a description of the water supplier's legal authority to implement the measure and efforts to work with other relevant agencies to ensure the implementation of the measure and to share the cost of implementation.	10631(g)	DMMs	See 10631(g) for additional wording.	Section 6, pg. 6-36. Not applicable – SqCWD has implemented each of the applicable DMMs.
30	(Describe) all water supply projects and water supply programs that may be undertaken by the urban water supplier to meet the total projected water use as established pursuant to subdivision (a) of Section 10635. The urban water supplier shall include a detailed description of expected future projects and programs, other than the demand management programs identified pursuant to paragraph (1) of subdivision (f), that the urban water supplier may implement to increase the amount of the water supply available to the urban water supplier in average, single-dry, and multiple-dry water years. The description shall identify specific projects and include a description of the increase in water supply that is expected to be available from each project. The description shall include an estimate with regard to the implementation timeline for each project or program.	10631(h)	System Supplies		Section 4, pg. 4-22 through 4-23. Table 4-7.
31	Describe the opportunities for development of desalinated water, including, but not limited to, ocean water, brackish water, and groundwater, as a long-term supply.	10631(i)	System Supplies		Section 4, pg. 4-15 through 4-16.

**SqCWD 2010 UWMP**  
**Section 8: Completed UWMP Checklist**

No.	UWMP requirement <sup>a</sup>	Calif. Water Code reference	Subject <sup>b</sup>	Additional clarification	UWMP location
32	Include the annual reports submitted to meet the Section 6.2 requirement (of the MOU), if a member of the CUWCC and signer of the December 10, 2008 MOU.	10631(j)	DMMs	Signers of the MOU that submit the annual reports are deemed compliant with Items 28 and 29.	Not applicable – SqCWD not a CUWCC member.
33	Urban water suppliers that rely upon a wholesale agency for a source of water shall provide the wholesale agency with water use projections from that agency for that source of water in five-year increments to 20 years or as far as data is available. The wholesale agency shall provide information to the urban water supplier for inclusion in the urban water supplier's plan that identifies and quantifies, to the extent practicable, the existing and planned sources of water as required by subdivision (b), available from the wholesale agency to the urban water supplier over the same five-year increments, and during various water-year types in accordance with subdivision (c). An urban water supplier may rely upon water supply information provided by the wholesale agency in fulfilling the plan informational requirements of subdivisions (b) and (c).	10631(k)	System Demands	Average year, single dry year, multiple dry years for 2015, 2020, 2025, and 2030.	Section 3, pg. 3-11 through 3-12.
34	The water use projections required by Section 10631 shall include projected water use for single-family and multifamily residential housing needed for lower income households, as defined in Section 50079.5 of the Health and Safety Code, as identified in the housing element of any city, county, or city and county in the service area of the supplier.	10631.1(a)	System Demands		Section 3, pg. 3-11. Table 3-9.
35	Stages of action to be undertaken by the urban water supplier in response to water supply shortages, including up to a 50 percent reduction in water supply, and an outline of specific water supply conditions which are applicable to each stage.	10632(a)	Water Supply Reliability . . .		Section 5, pg. 5-18 through 5-21. Tables 5-6, 5-7, 5-8 and 5-9.
36	Provide an estimate of the minimum water supply available during each of the next three water years based on the driest three-year historic sequence for the agency's water supply.	10632(b)	Water Supply Reliability . . .		Section 5, pg. 5-22, Table 5-10.

**SqCWD 2010 UWMP**  
**Section 8: Completed UWMP Checklist**

No.	UWMP requirement <sup>a</sup>	Calif. Water Code reference	Subject <sup>b</sup>	Additional clarification	UWMP location
37	(Identify) actions to be undertaken by the urban water supplier to prepare for, and implement during, a catastrophic interruption of water supplies including, but not limited to, a regional power outage, an earthquake, or other disaster.	10632(c)	Water Supply Reliability . . .		Section 5, pg. 5-7 through 5-10.
38	(Identify) additional, mandatory prohibitions against specific water use practices during water shortages, including, but not limited to, prohibiting the use of potable water for street cleaning.	10632(d)	Water Supply Reliability . . .		Section 5, pg. 5-13. Tables 5-6, 5-7, and 5-9.
39	(Specify) consumption reduction methods in the most restrictive stages. Each urban water supplier may use any type of consumption reduction methods in its water shortage contingency analysis that would reduce water use, are appropriate for its area, and have the ability to achieve a water use reduction consistent with up to a 50 percent reduction in water supply.	10632(e)	Water Supply Reliability . . .		Section 5, pg. 5-13. Tables 5-8 and 5-9.
40	(Indicated) penalties or charges for excessive use, where applicable.	10632(f)	Water Supply Reliability . . .		Section 5, pg. 5-13.
41	An analysis of the impacts of each of the actions and conditions described in subdivisions (a) to (f), inclusive, on the revenues and expenditures of the urban water supplier, and proposed measures to overcome those impacts, such as the development of reserves and rate adjustments.	10632(g)	Water Supply Reliability . . .		Section 5, pg. 5-14 through 5-16. Table 5-3.
42	(Provide) a draft water shortage contingency resolution or ordinance.	10632(h)	Water Supply Reliability . . .		Section 5, pg. 5-16. Appendix O.
43	(Indicate) a mechanism for determining actual reductions in water use pursuant to the urban water shortage contingency analysis.	10632(i)	Water Supply Reliability . . .		Section 5, pg. 5-22.
44	Provide, to the extent available, information on recycled water and its potential for use as a water source in the service area of the urban water supplier. The preparation of the plan shall be coordinated with local water, wastewater, groundwater, and planning agencies that operate within the supplier's service area	10633	System Supplies		Section 4, pg. 4-15 through 4-17.

**SqCWD 2010 UWMP**  
**Section 8: Completed UWMP Checklist**

No.	UWMP requirement <sup>a</sup>	Calif. Water Code reference	Subject <sup>b</sup>	Additional clarification	UWMP location
45	(Describe) the wastewater collection and treatment systems in the supplier's service area, including a quantification of the amount of wastewater collected and treated and the methods of wastewater disposal.	10633(a)	System Supplies		Section 4, pg. 4-17 through 4-19. Table 4-6.
46	(Describe) the quantity of treated wastewater that meets recycled water standards, is being discharged, and is otherwise available for use in a recycled water project.	10633(b)	System Supplies		Section 4, pg. 4-19.
47	(Describe) the recycled water currently being used in the supplier's service area, including, but not limited to, the type, place, and quantity of use.	10633(c)	System Supplies		Section 4, pg. 4-19.
48	(Describe and quantify) the potential uses of recycled water, including, but not limited to, agricultural irrigation, landscape irrigation, wildlife habitat enhancement, wetlands, industrial reuse, groundwater recharge, indirect potable reuse, and other appropriate uses, and a determination with regard to the technical and economic feasibility of serving those uses.	10633(d)	System Supplies		Section 4, pg. 4-20.
49	(Describe) The projected use of recycled water within the supplier's service area at the end of 5, 10, 15, and 20 years, and a description of the actual use of recycled water in comparison to uses previously projected pursuant to this subdivision.	10633(e)	System Supplies		Section 4, pg. 4-20 through 4-21.
50	(Describe the) actions, including financial incentives, which may be taken to encourage the use of recycled water, and the projected results of these actions in terms of acre-feet of recycled water used per year.	10633(f)	System Supplies		Section 4, pg. 4-21.
51	(Provide a) plan for optimizing the use of recycled water in the supplier's service area, including actions to facilitate the installation of dual distribution systems, to promote recirculating uses, to facilitate the increased use of treated wastewater that meets recycled water standards, and to overcome any obstacles to achieving that increased use.	10633(g)	System Supplies		Section 4, pg. 4-21.

**SqCWD 2010 UWMP**  
**Section 8: Completed UWMP Checklist**

No.	UWMP requirement <sup>a</sup>	Calif. Water Code reference	Subject <sup>b</sup>	Additional clarification	UWMP location
52	The plan shall include information, to the extent practicable, relating to the quality of existing sources of water available to the supplier over the same five-year increments as described in subdivision (a) of Section 10631, and the manner in which water quality affects water management strategies and supply reliability.	10634	Water Supply Reliability . . .	For years 2010, 2015, 2020, 2025, and 2030	Section 5, pg. 5-5 through 5-7.
53	Every urban water supplier shall include, as part of its urban water management plan, an assessment of the reliability of its water service to its customers during normal, dry, and multiple dry water years. This water supply and demand assessment shall compare the total water supply sources available to the water supplier with the total projected water use over the next 20 years, in five-year increments, for a normal water year, a single dry water year, and multiple dry water years. The water service reliability assessment shall be based upon the information compiled pursuant to Section 10631, including available data from state, regional, or local agency population projections within the service area of the urban water supplier.	10635(a)	Water Supply Reliability . . .		Section 5, pg. 5-22 through 5-24. Tables 5-11, 5-12, and 5-13.
54	The urban water supplier shall provide that portion of its urban water management plan prepared pursuant to this article to any city or county within which it provides water supplies no later than 60 days after the submission of its urban water management plan.	10635(b)	Plan Preparation		Section 1, pg. 1-3.
55	Each urban water supplier shall encourage the active involvement of diverse social, cultural, and economic elements of the population within the service area prior to and during the preparation of the plan.	10642	Plan Preparation		Section 1, pg. 1-3 through 1-5. Appendix C.

**SqCWD 2010 UWMP**  
**Section 8: Completed UWMP Checklist**

No.	UWMP requirement <sup>a</sup>	Calif. Water Code reference	Subject <sup>b</sup>	Additional clarification	UWMP location
56	Prior to adopting a plan, the urban water supplier shall make the plan available for public inspection and shall hold a public hearing thereon. Prior to the hearing, notice of the time and place of hearing shall be published within the jurisdiction of the publicly owned water supplier pursuant to Section 6066 of the Government Code. The urban water supplier shall provide notice of the time and place of hearing to any city or county within which the supplier provides water supplies. A privately owned water supplier shall provide an equivalent notice within its service area.	10642	Plan Preparation		Section 1, pg. 1-5 through 1-6. Appendices D and E
57	After the hearing, the plan shall be adopted as prepared or as modified after the hearing.	10642	Plan Preparation		Section 1, pg. 1-6.
58	An urban water supplier shall implement its plan adopted pursuant to this chapter in accordance with the schedule set forth in its plan.	10643	Plan Preparation		Section 1, pg. 1-6.
59	An urban water supplier shall submit to the department, the California State Library, and any city or county within which the supplier provides water supplies a copy of its plan no later than 30 days after adoption. Copies of amendments or changes to the plans shall be submitted to the department, the California State Library, and any city or county within which the supplier provides water supplies within 30 days after adoption.	10644(a)	Plan Preparation		Section 1, pg. 1-6 through 1-7. Table 1-2.
60	Not later than 30 days after filing a copy of its plan with the department, the urban water supplier and the department shall make the plan available for public review during normal business hours.	10645	Plan Preparation		Section 1, pg. 1-7.

a The UWMP Requirement descriptions are general summaries of what is provided in the legislation. Urban water suppliers should review the exact legislative wording prior to submitting its UWMP.

b The Subject classification is provided for clarification only. It is aligned with the organization presented in Part I of this guidebook. A water supplier is free to address the UWMP Requirement anywhere with its UWMP, but is urged to provide clarification to DWR to facilitate review.

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**Appendix A**  
**General Agency Outreach Documentation and Correspondence**

## Shelley Flock

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**From:** Toby Goddard [tgoddard@cityofsantacruz.com]  
**Sent:** Thursday, March 17, 2011 2:34 PM  
**To:** Aerin Martin; Beau Kayser; Brostrom, Peter N.; Charles McNiesh (E-mail); Haleigh Kleinman; jmueller@slvwd.com; john.ricker@co.santa-cruz.ca.us; Laurel Sato; Linette A Almond; Nick Johnson; Randy Deshazo; Ron Duncan; Shelley Flock; Stephanie Strelow (steph@strelowconsulting.com); Steve Palmisano (spalmisano@ci.watsonville.ca.us)  
**Subject:** Urban Water Management Plan Coordination Meeting  
**Attachments:** 03-24-11 agenda.doc

Good afternoon –

Attached is the agenda for next week's meeting.

It will be held on Thursday, March 24 at the City's Police Department Community Room, 155 Center Street, Santa Cruz, beginning at 10:00 a.m.

Peter Brostrom of the CA Department of Water Resources has offered to join us and answer questions about requirements and process for preparing an Urban Water Management Plan. Also, Randy Deshazo of AMBAG will be present to answer questions about the most recent Monterey Bay Area Regional Forecast, and discuss the 2010 Census and related planning issues.

Of course, the primary purpose of this meeting is to give everyone the opportunity to network on this project and share ideas and resources. Those of you who have already determined your agency's base daily per capita water use and chosen a method to determine your agency's water use target – please come prepared to discuss your approach.

Lunch will be provided.

I look forward to seeing you.

Toby

Toby Goddard  
Water Conservation Manager  
Santa Cruz Water Department  
Tel: (831) 420-5232

5/11/2011



# 2010 Urban Water Management Plan Coordination Meeting

03/24/11

10:00 a.m. to 1:00 p.m.

Police Department Community Room

155 Center Street

Santa Cruz

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**Facilitator:**

Toby Goddard

**Attendees:**

City of Santa Cruz Water, Planning

City of Watsonville Public Works

Soquel Creek Water District

Scotts Valley Water District

San Lorenzo Valley Water District

Santa Cruz County Environmental Health and Planning Departments

Association of Monterey Bay Area Governments

CA Dept. of Water Resources

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## ----- Agenda Topics -----

1. Introductions
2. Purpose of Meeting
3. Overview of Water Code 10610 - 10657
4. Recent Legislative Changes:
  - SB7 - 20x2020 – How are agencies planning to determine their urban water use target?
  - AB 1420 - Linkage of demand management measures to State grants and loans
  - SB 1087 - Lower income housing water use projections
5. DWR Guidebook, Checklists, and Review Forms
6. AMBAG Population, Housing and Employment Projections
  - 2010 US Census
  - AB 375 and related issues
7. Status of Local General Plans and Housing Elements
8. Adoption, Filing, and Implementation
9. Open Discussion – coordination on issues of mutual interest

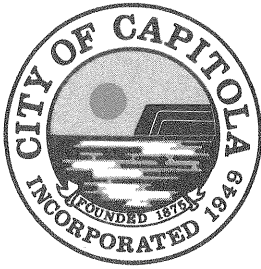
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## Other information

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**Please bring a copy of your agency's current plan. Lunch will be provided**

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RECEIVED

JUN 10 2011

S.C.W.D.

420 CAPITOLA AVENUE  
CAPITOLA, CALIFORNIA 95010  
TELEPHONE (831) 475-7300  
FAX (831) 479-8879

June 8, 2011

Laura D. Brown  
General Manager  
Soquel Creek Water District  
P.O. Box 1550  
Capitola, CA 95010

RE: Urban Water Management Plan and Capitola's General Plan Update

Dear Ms. Brown:

This letter is in response to your letter of April 6 advising us of the Water District's preparation of its 2010 Urban Water Management Plan. The City of Capitola is interested in receiving a copy of the draft plan for our review.

Capitola has recently begun the process of preparing a General Plan Update. While the draft General Plan and EIR will be at least another year or two away we would welcome your review of the draft documents as they are prepared. The easiest way to follow our progress is to visit our General Plan Update Website at [www.Plancapitola.com](http://www.Plancapitola.com) We will also provide notification to you when draft General Plan documents are available that may have an impact on water usage or water related infrastructure in the City of Capitola.

Sincerely,

David Foster  
Housing and Redevelopment Project Manager  
City of Capitola

Cc: Derek Johnson, Community Development Director



420 CAPITOLA AVENUE  
CAPITOLA, CALIFORNIA 95010  
TELEPHONE (831) 475-7300  
FAX (831) 479-8879

RECEIVED  
JUN 13 2011  
Sq.C. W. D.

June 8, 2011

Laura D. Brown  
General Manager  
Soquel Creek Water District  
P.O. Box 1550  
Capitola, CA 95010

RE: Urban Water Management Plan and Capitola City's General Plan Update

Dear Ms. Brown:

Thank you for the opportunity to participate in the development of the update of the Soquel Creek Water District's Urban Water Management Plan. The City of Capitola is interested in participating in the development of the plan and receiving a copy of the draft plan for our review and comment.

Capitola has recently begun the update of its 1989 General Plan. While the draft General Plan and EIR will not be adopted until 2013, we will circulate a draft for the City's review and comment prior to adoption. If you are interested in following the progress of the General Plan Update, we would encourage the City to track our progress by visiting the General Plan Update Website at [www.Plancapitola.com](http://www.Plancapitola.com)

While it is unknown at this time, what additional water demand may be associated with the City's update, we will need to coordinate any additional demand with the Water District to ensure that adequate supplies are available to meet the City's desired development goals, given existing and anticipated constraints on water supplies.

Should you have any questions about the City's General Plan update, please contact me at 831-475-7300 or at [djohnson@ci.capitola.ca.us](mailto:djohnson@ci.capitola.ca.us)

Sincerely yours,

Derek Johnson  
Community Development Director

Cc: Steve Jesberg, Public Works Director  
David Foster, Redevelopment and Housing Manager

**Appendix B**  
**Agency Notification**  
**(At Least 60 Days Prior to Public Hearing)**

The following agencies were sent a copy of the letter dated April 6, 2011 (attached) providing notification that SqCWD was currently preparing the 2010 Urban Water Management Plan (UWMP). Notifications were provided at least 60 days prior to the public hearing to consider adoption of the UWMP.

County of Santa Cruz  
Planning Department  
ATTN: Ms. Kathleen Previsich, Director  
701 Ocean Street, Room 410  
Santa Cruz, CA 95060

County of Santa Cruz  
Environmental Health Services Agency  
ATTN: Mr. John Ricker, Water Resources Division Director  
701 Ocean Street, Room 312  
Santa Cruz, CA 95060

County of Santa Cruz  
Board of Supervisors  
ATTN: Mr. John Leopold, Supervisor, First District  
701 Ocean St., Room 500  
Santa Cruz, CA 95060

County of Santa Cruz  
Board of Supervisors  
ATTN: Ms. Ellen Pirie, Supervisor, Second District  
701 Ocean Street, Room 500  
Santa Cruz, CA 95060

City of Capitola  
ATTN: Mr. Derek Johnson, Community Development Director  
420 Capitola Avenue  
Capitola, CA 95010

City of Santa Cruz  
Planning and Community Development Department  
ATTN: Ms. Juliana Rebagliati, Director  
809 Center Street, Room 107  
Santa Cruz, CA 95060

City of Santa Cruz Water Department  
ATTN: Mr. Bill Kocher, Director  
212 Locust Street  
Santa Cruz, CA 95060

City of Watsonville  
Public Works and Utilities  
ATTN: Mr. David Koch, Director  
P.C. Box 50000  
Watsonville, CA 95077-5000

Pajaro Valley Water Management Agency  
ATTN: Ms. Mary Bannister, General Manager  
36 Brennan Street  
Watsonville, CA 95076

Association of Monterey Bay Area Governments  
ATTN: Mr. Randy Deshazo, Principal Planner  
P.O. Box 809  
Marina, CA 93933-0809

Central Water District  
ATTN: Mr. Ralph Bracamonte, General Manager  
P.O. Box 1869  
Aptos, CA 95001-1869

Scotts Valley Water District  
ATTN: Mr. Charles McNiesh, General Manager  
P.O. Box 660006  
Scotts Valley, CA 95067

April 6, 2011

City of Capitola  
ATTN: Mr. Derek Johnson, Community Development Director  
420 Capitola Avenue  
Capitola, CA 95010

**SUBJECT: Notification Regarding Preparation of Soquel Creek Water District's  
2010 Urban Water Management Plan**

Dear Mr. Johnson:

In accordance with the California Water Code requirements for Urban Water Management Planning (Section 10621, Division 6, Part 2.6), Soquel Creek Water District (SqCWD) is providing notice that we are currently preparing our 2010 Urban Water Management Plan (UWMP). The UWMP is a long-range planning document that focuses on current and projected water supplies and demand, as well as water supply reliability, water shortage contingency planning and conservation. Your agency may rely on the UWMP to verify the adequacy of water supplies for land use planning or use the information for other purposes.

We anticipate that a draft 2010 UWMP will be available for public review and comment in late May or early June 2011, and a public hearing will be held in June to consider adoption of the Plan.

We will provide notification to you when the draft UWMP is available for public review and a date has been established for a public hearing. We look forward to receiving your input on this Plan.

Should you have any questions, please feel free to contact Ron Duncan, Conservation/Customer Service Field Manager via email at [rond@soquelcreekwater.org](mailto:rond@soquelcreekwater.org) or by phone at (831) 475-8500 ext. 144.

Sincerely,  
SOQUEL CREEK WATER DISTRICT



Laura D. Brown  
General Manager

**Appendix C**  
**Community Outreach Materials**

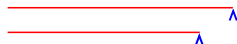


**SOQUEL CREEK  
WATER DISTRICT**

Soquel Creek Water District  
P.O. Box 1550  
Capitola, CA 95010-1550

## RETURN SERVICE REQUESTED

\*\*AUTO\*\*SCH 5-DIGIT 95001 2 PSS 66937RD18-A-1  
318 1 AV 0.340



## Consumption History

	Current	Prior Year
Units Per Billing Period:	1	7
Gallons Per Billing Period:	748	5236
No. Days in Billing Period:	58	57
Gallons Consumed Per Day:	13	92

### Water Use Efficiency

Efforts to use water efficiently are appreciated.  
Your average **Gallons Consumed Per Day** is  
85.87% Less than the same period last year. For more  
information on saving water, contact the District Office at  
(831) 475-8500.

## Billing Information

321

Account Number:  
Service Address:  
Prior Meter Read: 103 Current Meter Read: 104  
Service From: 02/15/11 Service To: 04/14/11

## Account Summary

Previous Balance:	\$41.10
Payments:	\$41.10
Adjustments:	\$0.00
Tier 1 Water Quantity Charge: 1 Units @ \$3.22	\$3.22
Tier 2 Water Quantity Charge: 0 Units @ \$6.15	\$0.00
Tier 3 Water Quantity Charge: 0 Units @ \$10.65	\$0.00
Service Charge: 5/8 inch	\$36.83
Fire Service Charge:	\$0.00

**Total Amount Due: \$40.05**

## Three Year Usage Summary

Year	2011	2010	2009
Jan/Feb	3	6	0
Mar/Apr	1	7	0
May/Jun		10	0
Jul/Aug		13	6
Sep/Oct		8	7
Nov/Dec		4	7
Totals	4	48	20

Periods listed reflect month meter was read.  
Refer to **Billing Information** for Service From/To.

## Messages

The District is updating its Urban Water Management Plan. The main purpose of the plan is to ensure adequate water supplies are available in the future. A draft version of the plan will be available on our web site in late spring. For more information contact Shelley Flock at 831-475-8501 x156. Your input is encouraged. New rates take effect this billing period for water consumed after January 1, 2011.

Detach and return this portion with your check (**NO CASH**) in the remittance envelope provided.

Make sure remit address shows through window.



**SOQUEL CREEK  
WATER DISTRICT**

Soquel Creek Water District  
P.O. Box 1550  
Capitola, CA 95010-1550

## Billing Information

Account Number:  
Service Address:  
Prior Meter Read: 103 Current Meter Read: 104  
Service From: 02/15/11 Service To: 04/14/11

<b>Total Amount Due:</b>	<b>\$40.05</b>
<b>Due Date:</b>	<b>05/06/11</b>

Make check payable to **Soquel Creek Water District**.  
Please write your account number on your check.

**To pay by credit card** call (831) 475-8500 or register  
online at [www.soquelcreekwater.org](http://www.soquelcreekwater.org)



SOQUEL CREEK WATER DISTRICT  
P.O. BOX 1550  
CAPITOLA, CA 95010-1550

SEE REVERSE FOR PAYMENT OPTIONS

042391000000040054

B6 SATURDAY, FEBRUARY 5, 2011

## County agencies plan to ensure future's not a wash

**E**ver wondered how water agencies know if they will have enough water to serve their communities in the future? Well, one of the ways to help plan for sufficient future water supplies is through the preparation of a document called the Urban Water Management Plan.



**RON  
DUNCAN**  
*Go Green*

Every five years, California law requires all water providers that serve more than 3,000 connections or supply more than 3,000 acre-feet of water (roughly 1 billion gallons) per year to perform an evaluation and prepare an Urban Water Management Plan.

The main purposes are for long-term water resource planning and to ensure adequate supplies are available for current and planned future demand.

Demonstrating that an agency is meeting specified water conservation measures is an important component. Failure to produce an acceptable plan jeopardizes an agency's ability to receive state grants.

Locally, the Scotts Valley Water District, San Lorenzo Valley Water District, Santa Cruz Water Department, Soquel Creek Water District and the Watsonville Water Department will be preparing their plans over the next several months with a completion goal of July 1. While most water agencies recognize their responsibility to meet both current and future water needs and have long-term plans in place, an Urban Water Management Plan generates analysis and documentation that may not otherwise occur.

Aside from being an opportunity for agencies to take stock of their water supply, the plans provide the public with an opportunity to review a water agency's current and forecasted water supply and what conservation measures they have in place or are planning. It is not only a requirement that the public be given opportunities to review and comment on the plan, it is part of the spirit behind the document.

Some new components in 2011 are how agencies will meet the state mandate of a 20 percent water reduction

by 2020, and how climate change may impact their supply. These are timely subjects. Water conservation continues to play an integral role for most suppliers in response to California's general water scarcity. Climate change can have a double whammy effect upon water resources, causing both a decrease in supply as a result of changes in rainfall and an increase in use due to warmer temperatures.

Be on the lookout in the coming months for your water agency's solicitation for input to their plan, or contact them directly to know when a draft will be available to review. General plan information can be found at the Department of Water Resources website, [www.water.ca.gov/urbanwatermanagement](http://www.water.ca.gov/urbanwatermanagement).

Water is a community resource, and one that is best managed with community input.

---

*Ron Duncan writes a biweekly column for the Sentinel. He is a manager for the Soquel Creek Water District, which offers free visits to homes and businesses and suggests ways to save water. Contact him at [rond@soquelcreekwater.org](mailto:rond@soquelcreekwater.org) or call the district at 475-8500.*

## Santa Cruz Sentinel.com

### Go Green, Ron Duncan: County agencies plan to ensure the future's not a wash

Posted: 02/05/2011 01:30:47 AM PST

Ever wondered how water agencies know if they will have enough water to serve their communities in the future? Well, one of the ways to help plan for sufficient future water supplies is through the preparation of a document called the Urban Water Management Plan.

Every five years, California law requires all water providers that serve more than 3,000 connections or supply more than 3,000 acre-feet of water roughly 1 billion gallons per year to perform an evaluation and prepare an Urban Water Management Plan. The main purposes are for long-term water resource planning and to ensure adequate supplies are available for current and planned future demand.

Demonstrating that an agency is meeting specified water conservation measures is an important component. Failure to produce an acceptable plan jeopardizes an agency's ability to receive state grants.

Locally, the Scotts Valley Water District, San Lorenzo Valley Water District, Santa Cruz Water

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Be on the lookout in the coming months for your water agency's solicitation for input to their plan,

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## Santa Cruz Sentinel.com

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Water is a community resource, and one that is best managed with community input.

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\*\$99.00 Customer Installation Charge. 36-Month Monitoring Agreement required at \$55.99 per month (\$3,195.60). Form of payment must be by credit card or electronic charge to your checking or savings account. Offer applies to homeowners only. Local permit fees may be required. Satisfactory credit history required. Certain restrictions apply. Offer valid for new Security Choice - An ADT Authorized Dealer customers only and not on purchases from ADT Security Services, Inc. Other rate plans available. Cannot be combined with any other offer. \*\*\$100 VISA® Gift Card Offer: \$100 VISA Gift Card is provided by Security Choice and is not sponsored by ADT Security Services. Requires mail-in redemption. Call 1-800-467-2330 for complete restrictions and redemption requirements.

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## Water Supply

Home » Water Supply

Urban Water Management Plan

2005 UWMP

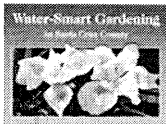
Integrated Resource Plan

Well Master Plan

Groundwater Management Plan

SCWD2 Desalination Program

Soquel Creek Water District  
 5180 Soquel Drive  
 Mailing Address  
 P.O. Box 1550  
 Capitola, CA 95010  
 phone (831)475-8500  
 fax (831)475-4291  
 custserv@soquelcreekwater.org



## Urban Water Management Plan

### Soquel Creek Water District 2010 Urban Water Management Plan Update

Soquel Creek Water District (SqCWD) is currently in the process of developing its 2010 Urban Water Management Plan (UWMP). We anticipate that a draft 2010 UWMP will be available for public review in early June, and that a Public Hearing will be held on June 21, 2011 for the SqCWD Board of Directors to receive public comment on the draft Plan and consider adoption. For more information on the draft 2010 UWMP or the Public Hearing, please contact Shelley Flock at (831)475-8501, extension 156, or by email at shellelyf@soquelcreekwater.org.

### Urban Water Management Planning Act

The California Urban Water Management Planning Act (Act) (California Water Code, Division 6, Part 2.6) requires all water providers that have 3,000 or more service connections, or annually supply more than 3,000 acre-feet of water (approximately 1 billion gallons), to prepare and adopt an UWMP every five years.

The main purpose of the Act is to require water suppliers to achieve proper water supply planning to ensure adequate supplies are available to meet existing and future demands. Suppliers are required to assess current demands and supplies over a 20-year planning horizon and consider various drought scenarios. The Act also requires suppliers to conduct water shortage contingency planning and develop drought response actions, and to report on water demand management measures that the supplier has implemented to increase water conservation.

The Act became part of the California Water Code in 1983 with the passage of Assembly Bill 797. The Act has been amended and expanded since its inception, including recent amendments resulting from the 2009 passage of Senate Bill X7-7 (SBX7-7). SqCWD has produced an UWMP every five years since the first Plan was required in 1985. The last UWMP SqCWD produced was in 2005, and under routine circumstances, the 2010 UWMP would have been due in December of 2010. However, due to new requirements associated with SBX7-7, State law extended the deadline for adopting 2010 Plans to July 1, 2011.

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Soquel Creek Water District  
5180 Soquel Drive  
Mailing Address  
P.O. Box 1550  
Capitola, CA 95010  
phone (831)475-8500  
fax (831)475-4291  
custiserv@soquelcreekwater.org

## Soquel Creek Water District Draft 2010 Urban Water Management Plan Now Available

Posted Fri, 07/15/2011 - 3:06pm by admin

Latest News

### Soquel Creek Water District 2010 Urban Water Management Plan Update

The Soquel Creek Water District (SqCWD) Draft 2010 Urban Water Management Plan (UWMP) is now available for public review and comment. The Draft 2010 UWMP is complete with the exception of Section 5 (Water Supply Reliability and Water Shortage Contingency Planning) which is currently being developed and Section 8 (UWMP Checklist) which will be completed when all of the sections are drafted. Additionally, we plan to add new information to Sections 2 and 4 regarding revised protective water levels and sustainable yield for the portion of the Aromas Red Sands aquifer that is utilized by the District. This information will be presented by SqCWD's consulting hydrologist, HydroMetrics WR1, in August and will be incorporated into the final Draft 2010 UWMP.

Staff plans to complete the final Draft 2010 UWMP in August, and to schedule a public hearing for the September 6, 2011 Board meeting to present the final draft UWMP for additional public input and Board adoption.

For more information on the draft 2010 UWMP, please contact Shelley Flock at (831)475-8501, extension 156, or by email at [shelleyf@soquelcreekwater.org](mailto:shelleyf@soquelcreekwater.org).

[Click here to view the Draft 2010 Urban Water Management Plan.](#)

### Urban Water Management Planning Act

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Soquel Creek Water District  
5180 Soquel Drive  
Mailing Address  
P.O. Box 1550  
Capitola, CA 95010  
phone (831)475-8500  
fax (831)475-4291  
custserv@soquelcreekwater.org

## Soquel Creek Water District Releases Final Draft 2010 Urban Water Management Plan - Public Hearing Scheduled for September 20, 2011

Posted Thu, 09/01/2011 - 1:18pm by admin

Latest News

### Release of Final Draft 2010 UWMP

On September 1, 2011, Soquel Creek Water District (SqCWD) released a final Draft 2010 Urban Water Management Plan (UWMP) for public review and comment. The Draft 2010 UWMP is a long-range planning document that assesses current water demand, projects future demand over a 20-year planning horizon, and identifies a mix of water resources and conservation efforts to meet future demand. The Draft UWMP also contains details on SqCWD's water shortage contingency planning and drought response actions.

To review the Draft 2010 UWMP, please click on the link below. The Draft Plan is also available for public review at the SqCWD office during normal business hours. Please submit written comments by 4:00 p.m. on September 15, 2011 to be considered by the SqCWD Board of Directors. Written comments may be submitted to Shelley Flock at SqCWD, P.O. Box 1550, Capitola, CA 95010, or email to [shelleyf@soquelcreekwater.org](mailto:shelleyf@soquelcreekwater.org).

### Public Hearing Scheduled for September 20, 2011

A public hearing to receive comments on the Draft 2010 Plan and SqCWD's compliance with the 2009 Water Conservation Act is scheduled for September 20, 2011. After the public hearing, the Board of Directors will consider adoption of the Draft 2010 Plan. The public hearing will be held at the SqCWD office located at 5180 Soquel Drive in Soquel at 7:00 p.m.

If you have questions about the Draft 2010 UWMP or the public hearing, please contact Shelley Flock at the above email address or by phone at (831) 475-8501 ext. 156.

Draft 2010 Urban Water Management Plan

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# What's On Tap

at the Soquel Creek Water District

VOLUME 13, NO. 2

MARCH/APRIL 2011

Printed with Soy Ink on Recycled Paper

## Prohibitions on Wasting Water

The ordinance prohibiting water waste has been revised to be more stringent as we need to preserve our limited water supplies for beneficial uses.

In addition to the general prohibition of indiscriminately running water for no purpose or unreasonable uses, the Ordinance specifically prohibits:

- Using water to wash down hard/paved surfaces such as driveways, unless a broom or other waterless device will not suffice, or as necessary for safety or sanitary reasons.
- Washing building exteriors, vehicles and boats without the use of a positive shut-off nozzle (provided free of charge to customers upon request) or a pressure washer.
- Irrigating in a way that allows water to runoff the area being watered onto sidewalks, driveways, streets, etc.
- Irrigating with overhead spray (i.e.,

sprinklers) between 10:00 a.m. and 8:00 p.m. unless special dispensation has been granted for landscape maintenance performed by contractors.

- Allowing water to escape through plumbing leaks, breaks or malfunctions within the customer's water system for any substantial period of time beyond which the problem should have been corrected or the flow of water stopped.

Our approach will be to inform and educate; however, the ordinance does contain penalty provisions. After two written notices of chronic or repetitive violations within a one-year period, water service may be turned off or the flow restricted and reconnection fees will be assessed. Alternatively, upon conviction, violators may be fined up to \$600 or imprisoned up to 30 days, or both.

To view the water waste regulations, please go to [www.soquelcreekwater.org](http://www.soquelcreekwater.org) under Conservation.

## District Saves Money and Energy

Two District projects received energy efficiency incentives from Pacific Gas & Electric (PG&E) through a program administered by the Center for Irrigation Technology at California State University, Fresno. The program provides rebates for upgrades in pumping equipment when increases in efficiency are realized.

In 2010, the District replaced pumping equipment at Maplethorpe Booster Station where overall pumping efficiency was increased by 4% and at Bonita Well where an increase of 28% was achieved. In addition to the \$9,931 received in rebates, increased pumping efficiency also helps the District reduce energy demand year after year.



5180 Soquel Drive  
P.O. Box 1550  
Capitola, CA 95010

Phone: 831-475-8500  
Fax: 831-475-4291

Email:  
[custserv@soquelcreekwater.org](mailto:custserv@soquelcreekwater.org)  
Web:  
[www.soquelcreekwater.org](http://www.soquelcreekwater.org)

Our Board of Directors meets on the first and third Tuesday of each month at 7:00 pm at the District office. Meetings are open to everyone and comments from the public are heard at each meeting.

 SOQUEL CREEK  
WATER DISTRICT

# You are Getting Better All the Time

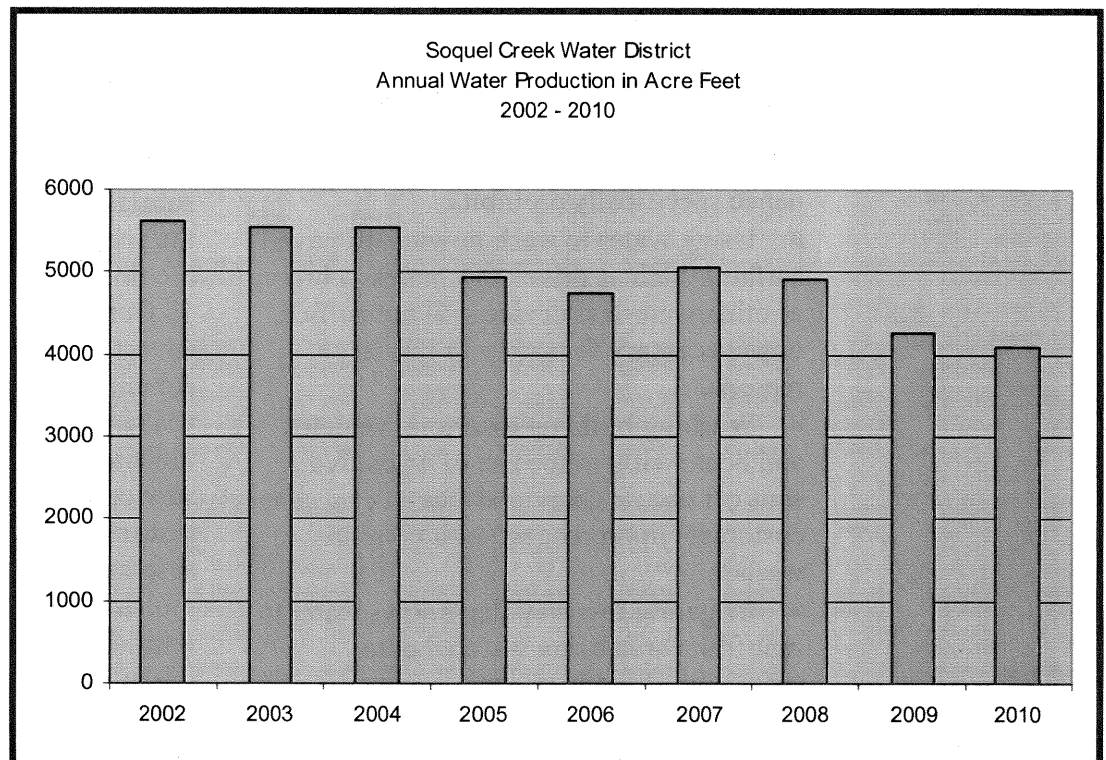
*In response to education about overdrafting of our local groundwater resources and the corresponding water supply shortage, customers have reacted by lowering consumption.*

District customers just keep getting better and better at using water more efficiently. In 2010, customers collectively used less water than any of the previous 26 years (since 1984).

In response to education about overdrafting of our local groundwater resources and the corresponding water supply shortage, customers have reacted by lowering consumption. In fact, as shown in the graph, water production has steadily declined 27

percent from the peak in 2002.

That is the good news. The bad news is that current usage continues to exceed the sustainable yield of our aquifers. This means that our groundwater resources are not recovering to safe levels and continue to be vulnerable to seawater intrusion. Please continue to make every effort to reduce water consumption while we continue pursuing ways to supplement our water supply. Thank you for being so water conscious.



## Urban Water Management Plan

Have you ever wondered how water agencies know if they will have enough water to serve their communities in the future? Well, one of the ways to help plan for sufficient future water supplies is through the preparation of a document called the Urban Water Management Plan (UWMP).

Every five years, California law requires all water providers that serve more than 3,000 connections or supply over 3,000 acre-feet of water per year (roughly 1 billion gallons) to perform an evaluation and prepare an UWMP. The main purposes of these plans are to support long-term

water resource planning and to ensure that adequate water supplies are available for current and planned future demand.

In the coming months, the District will be publishing a draft UWMP for public review. If you have questions, please contact our Conservation and Customer Service Manager (Ron Duncan) at (831) 475-8501, extension 144.

**What's On Tap** is an in-house publication printed bi-monthly for the customers of our District. Forward your comments to the editor at P.O. Box 1550, Capitola, CA, 95010.



## **City of Santa Cruz Water Department and Soquel Creek Water District scwd<sup>2</sup> Desalination Program**

### **Monthly Project Update – February 2011**

#### **Even with Recent Rainfall, Water Shortages Still Face City of Santa Cruz and Soquel Creek Water District**

An exceptionally wet December certainly helped to ease immediate drought conditions locally and throughout the state, but even with the heavy rains the City of Santa Cruz (City) and the Soquel Creek Water District (District) still face long-term water supply problems.

The options for supplemental water supplies for the City and the District have been exhaustively considered and both agencies identified the proposed scwd<sup>2</sup> Regional Seawater Desalination Project as the best option for a supplemental water source. The City needs additional water supply in the event of extended drought and the likelihood of reduced supplies from surface streams to protect endangered fish species. The District needs additional water supply to protect its overdrafted aquifers and prevent seawater intrusion in the Soquel-Aptos Basin.

#### **Urban Water Management Plans to be updated in 2011**

The City and District are both preparing updates to their Urban Water Management Plans (UWMPs). UWMPs are required to be updated by most California's urban water suppliers every five years and are used for long-term resource planning and to ensure adequate water supplies are available to meet existing and future water demands. As a part of these plans, each agency will be updating information on water demands, supply reliability, water conservation measures, and water shortage contingency planning.

The updated information which will address some of the comments received during scoping related to current and future demands shall be incorporated into the Draft Environmental Impact Report (EIR) that is being developed for the proposed **scwd<sup>2</sup>** Regional Seawater Desalination Project.

#### **CEQA Update**

The formal scoping period for the proposed **scwd<sup>2</sup>** Regional Seawater Desalination Project began on November 15, 2010 and ended on January 10, 2011. Two scoping meetings were held on December 8, 2010 to provide information and to solicit comments about the scope of the Environmental Impact Report (EIR). A scoping report, which summarizes the scoping process and provides a detailed overview of the public


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## Documents

[scwd<sup>2</sup> Task Force Mtgs.-  
Agendas & Minutes](#)
[White Papers & Fact Sheets](#)
[Desal. Program Materials](#)
[Desal. Program Reports](#)
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## In the News

As You See It: Updated Water Plan

Santa Cruz Sentinel, 02/04/2011

The discussion about the need for a regional desalination plant includes questions about water demands, existing and potential supplies and water conservation measures for the city of Santa Cruz and the Soquel Creek Water District. The city and district are both preparing updates to their Urban Water Management Plans. UWMPs are required to be updated by most California urban water suppliers every five years and are used for long-term resource planning and to ensure adequate water supplies are available to meet existing and future water demands. As a part of these plans, each agency will be updating information on water demands, supply reliability, water conservation measures and water-shortage contingency planning. This updated information will be incorporated and evaluated in the draft Environmental Impact Report that is being developed for the proposed scwd<sup>2</sup> Regional Seawater Desalination Project.

Bill Kocher, director, Santa Cruz Water Department

Laura Brown, general manager, Soquel Creek Water District

[scwd<sup>2</sup> Task Force Meetings- Agendas & Minutes](#)
[scwd<sup>2</sup> White Papers & Fact Sheets](#)
[scwd<sup>2</sup> Desalination Program Materials](#)
[Technical and Project Reports](#)
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## **City of Santa Cruz Water Department and Soquel Creek Water District scwd<sup>2</sup> Desalination Program**

### **Monthly Project Update & Latest News – July 2011**

#### **Technical Working Group evaluates list of Renewable Energy and Greenhouse Gas (GHG) Reduction Projects that will reduce the carbon footprint for the proposed desalination project**

Energy consumption and GHG emissions from the proposed desalination project are of major importance for both the City of Santa Cruz and Soquel Creek Water District. We are committed to evaluating ways to reduce the project's energy requirements and how to make the project net carbon neutral. As part of the Energy Minimization and GHG Reduction Study (Energy Study), staff from both agencies recently met with technical experts in a day-long workshop to discuss potential projects that would reduce energy and carbon emissions for the project. More than 45 projects were discussed, including converting food waste to energy at the wastewater treatment plant, various types of solar projects, wind/wave/tidal/hydro projects, renewable purchases, GHG offsets, and additional water conservation programs, to name a few. The group highlighted 15 projects to recommend for approval to the **scwd<sup>2</sup>** Task Force for further evaluation in the Energy Study. This recommendation will be considered at the July 20, 2011 Task Force meeting.

Monthly status updates on the Energy Study are available on our project website at [http://www.scwd2desal.org/Page-Energy.php#Status Reports of the Energy Study](http://www.scwd2desal.org/Page-Energy.php#Status_Reports_of_the_Energy_Study).

#### **City of Santa Cruz amends municipal code to allow graywater systems for irrigation**

On June 28, 2011, the City Council adopted Ordinance 2011-04 that amends the SC Municipal Code and adds a new section to allow graywater use for irrigation. Graywater is wastewater that originates from showers, bathtubs, bathroom sinks and clothes washing machines. To view the ordinance, click here:

<http://64.175.136.240/sirepub/cache/2/c15i4145n4nfuw55yt0vpgna/286706707052011025341754.PDF>. This ordinance will go into effect July 28, 2011.

#### **Urban Water Management Plan Updates**

The City of Santa Cruz and Soquel Creek Water District are currently each preparing their 2010 Urban Water Management Plans (UWMPs) which includes updating information on water demands, supply reliability, water conservation measures and water shortage contingency planning. Both agencies are planning on completing a draft of their UWMPs for public review and comment in late summer or early fall, and holding public hearings shortly thereafter.

#### **Inquisitive Minds Want to Know ...**

**Appendix D**  
**Copy of Published Legal Notice and Published Ads**

Thursday, September 1, 2011

SANTA CRUZ SENTINEL

C - 5

Public Notices

Public Notices

Public Notices

Public Notices

**NOTICE OF PUBLIC HEARING TO CONSIDER  
ADOPTION OF THE  
SOQUEL CREEK WATER DISTRICT  
DRAFT 2010 URBAN WATER MANAGEMENT PLAN**

NOTICE IS HEREBY GIVEN that a public hearing will be held on Tuesday, September 20, 2011, at 7:00 p.m. to receive public comments regarding compliance with the Water Conservation Bill of 2009 and to consider adoption of the Draft 2010 Urban Water Management Plan (UWMP). The public hearing will be held at the Soquel Creek Water District office located at 5180 Soquel Drive in Soquel.

The Draft 2010 UWMP is a long-range planning document that assesses current water demand, projects future demand over a 20-year planning horizon, and identifies a mix of water resources and conservation efforts to meet future demand. The Draft 2010 UWMP also contains details on SqCWD's water shortage contingency planning and drought response actions.

A copy of the Draft 2010 UWMP is available for public review on the SqCWD's website at [www.socuelcreekwater.org](http://www.socuelcreekwater.org). Additionally, the Draft 2010 UWMP is available for public review during normal business hours at the SqCWD office. Written comments on the Draft 2010 UWMP must be received no later than 4:00 p.m. on September 15, 2011 to be considered by the Board of Directors. Address written comments to Shelley Flock at SqCWD, P.O. Box 1550, Capitola, CA 95010, or email to [shelleyf@socuelcreekwater.org](mailto:shelleyf@socuelcreekwater.org).

If you have questions regarding the SqCWD Draft 2010 UWMP or the public hearing, please contact Shelley Flock at the above email address or by phone at 831-475-8501 ext. 156.  
9/1,11

4139587

**Public Notices**

**Public Notices**

**NOTICE OF PUBLIC HEARING TO CONSIDER  
ADOPTION OF THE  
SOQUEL CREEK WATER DISTRICT  
DRAFT 2010 URBAN WATER MANAGEMENT PLAN**

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A copy of the Draft 2010 UWMP is available for public review on the SqCWD's website at [www.socquelcreekwater.org](http://www.socquelcreekwater.org). Additionally, the Draft 2010 UWMP is available for public review during normal business hours at the SqCWD office. Written comments on the Draft 2010 UWMP must be received no later than 4:00 p.m. on September 15, 2011 to be considered by the Board of Directors. Address written comments to Shelley Flock at SqCWD, P.O. Box 1550, Capitola, CA 95010, or email to [shelleyf@soquelcreekwater.org](mailto:shelleyf@soquelcreekwater.org).

If you have questions regarding the SqCWD Draft 2010 UWMP or the public hearing, please contact Shelley Flock at the above email address or by phone at 831-475-8501 ext. 156.  
9/1/11

4139587

**Soquel Creek H2O District**

**Urban Water Management**

**August 2011**

**Mid County Post**

**3.8 x 5.7**

**Send to:** [mcpost@mcpost.com](mailto:mcpost@mcpost.com)

[max@mcpost.com](mailto:max@mcpost.com)

**Soquel Creek Water District**

# **Draft Urban Water Management Plan**

*Accepting Public Comment*

**Tuesday Sept. 20, 2011 , 7:00pm**

**At the District office  
5180 Soquel Drive, Soquel**

**Available for review at:**

- Soquel Creek Water  
District Office
- Online at  
[www.soquelcreekwater.org](http://www.soquelcreekwater.org)



**Call 475-8500 for  
more information.**



**Soquel Creek H2O District**

**Urban Water Manage ad**

**Aug. 2011**

**Santa Cruz Weekly**

**New size: 4.3438" x 3.125"**

**Send to: [jocelyn@santacruzweekly.com](mailto:jocelyn@santacruzweekly.com)**

**Soquel Creek Water District  
Draft Urban Water Management Plan**

*Accepting Public Comment*

**Tuesday Sept. 20, 2011 , 7:00pm**

At the District office  
5180 Soquel Drive, Soquel

**Available for review at:**

- Soquel Creek Water District Office
- Online at [www.soquelcreekwater.org](http://www.soquelcreekwater.org)



**SOQUEL CREEK  
WATER DISTRICT**



**Call 475-8500 for more information.**

**Appendix E**  
**Agency Notification of Draft UWMP & Public Hearing**



**Board of Directors**  
Dr. Thomas R. LaHue, *President*  
Bruce Daniels, *Vice President*  
Dr. Don Hoernschemeyer  
Dr. Bruce Jaffe  
Daniel F. Kriege

Laura D. Brown, *General Manager*

September 1, 2011

City of Capitola  
ATTN: Mr. Derek Johnson, Community Development Director  
420 Capitola Avenue  
Capitola, CA 95010

**SUBJECT: Notice of Public Hearing to Consider Adoption of the Soquel Creek Water District Draft 2010 Urban Water Management Plan (UWMP) and Copy of Draft 2010 UWMP for Public Review**

Dear Mr. Johnson:

Please find the attached copy of the Soquel Creek Water District (SqCWD) 2010 Draft Urban Water Management Plan (UWMP) for your review. The UWMP is a long-range planning document that focuses on current and projected water supplies and demand, as well as water supply reliability, water shortage contingency planning and conservation. Your agency may rely on the UWMP to evaluate the adequacy of water supplies for land use planning or use the information for other purposes.

Additionally, the SqCWD is providing notice that our Board of Directors will hold a public hearing to receive public comments and consider adoption of the Draft 2010 Urban Water Management Plan (UWMP). Details of the public hearing are as follows:

**Date/Time: Tuesday, September 20, 2011 at 7:00 p.m.**  
**Place: Board of Directors Meeting, SqCWD Office**  
**5180 Soquel Avenue, Soquel, CA**

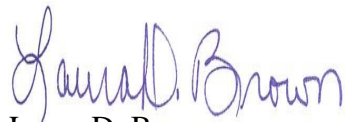
SqCWD staff anticipates the Board adopting the Draft 2010 UWMP with recommended minor modifications at the September 20, 2011 meeting after hearing public input. If significant modifications are recommended, the Draft 2010 UWMP will be revised and brought back at another Board of Directors meeting for a public hearing and adoption.

Written comments on the Draft 2010 UWMP must be received by 4:00 p.m. on Thursday, September 15, 2011 for inclusion with the Board packet for the public hearing and sent to:

Soquel Creek Water District  
Attn: Shelley Flock, Staff Analyst  
P.O. Box 1550  
Capitola, CA 95010  
Fax: (831) 475-4291; email: [shelleyf@soquelcreekwater.org](mailto:shelleyf@soquelcreekwater.org)

We look forward to receiving your input on this Plan. Should you have any questions, please feel free to contact Ron Duncan, Conservation/Customer Service Field Manager via email at [rond@soquelcreekwater.org](mailto:rond@soquelcreekwater.org) or by phone at (831) 475-8500 ext. 144.

Sincerely,  
SOQUEL CREEK WATER DISTRICT



Laura D. Brown  
General Manager



**Board of Directors**  
Dr. Thomas R. LaHue, *President*  
Bruce Daniels, *Vice President*  
Dr. Don Hoernschemeyer  
Dr. Bruce Jaffe  
Daniel F. Kriege

Laura D. Brown, *General Manager*

September 1, 2011

County of Santa Cruz Planning Department  
ATTN: Ms. Kathleen Previsich, Director  
701 Ocean Street, Room 410  
Santa Cruz, CA 95060

**SUBJECT: Notice of Public Hearing to Consider Adoption of the Soquel Creek Water District Draft 2010 Urban Water Management Plan (UWMP) and Copy of Draft 2010 UWMP for Public Review**

Dear Ms. Previsich:

Please find the attached copy of the Soquel Creek Water District (SqCWD) 2010 Draft Urban Water Management Plan (UWMP) for your review. The UWMP is a long-range planning document that focuses on current and projected water supplies and demand, as well as water supply reliability, water shortage contingency planning and conservation. Your agency may rely on the UWMP to evaluate the adequacy of water supplies for land use planning or use the information for other purposes.

Additionally, the SqCWD is providing notice that our Board of Directors will hold a public hearing to receive public comments and consider adoption of the Draft 2010 Urban Water Management Plan (UWMP). Details of the public hearing are as follows:

**Date/Time: Tuesday, September 20, 2011 at 7:00 p.m.**  
**Place: Board of Directors Meeting, SqCWD Office**  
**5180 Soquel Avenue, Soquel, CA**

SqCWD staff anticipates the Board adopting the Draft 2010 UWMP with recommended minor modifications at the September 20, 2011 meeting after hearing public input. If significant modifications are recommended, the Draft 2010 UWMP will be revised and brought back at another Board of Directors meeting for a public hearing and adoption.

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Soquel Creek Water District  
Attn: Shelley Flock, Staff Analyst  
P.O. Box 1550  
Capitola, CA 95010  
Fax: (831) 475-4291; email: [shelleyf@soquelcreekwater.org](mailto:shelleyf@soquelcreekwater.org)

We look forward to receiving your input on this Plan. Should you have any questions, please feel free to contact Ron Duncan, Conservation/Customer Service Field Manager via email at [rond@soquelcreekwater.org](mailto:rond@soquelcreekwater.org) or by phone at (831) 475-8500 ext. 144.

Sincerely,  
SOQUEL CREEK WATER DISTRICT



Laura D. Brown  
General Manager



**Board of Directors**  
Dr. Thomas R. LaHue, *President*  
Bruce Daniels, *Vice President*  
Dr. Don Hoernschemeyer  
Dr. Bruce Jaffe  
Daniel F. Kriege

Laura D. Brown, *General Manager*

September 1, 2011

County of Santa Cruz  
Environmental Health Services Agency  
ATTN: Mr. John Ricker, Water Resources Division Director  
701 Ocean Street, Room 312  
Santa Cruz, CA 95060

**SUBJECT: Notice of Public Hearing to Consider Adoption of the Soquel Creek Water District Draft 2010 Urban Water Management Plan (UWMP) and Copy of Draft 2010 UWMP for Public Review**

Dear Mr. Ricker:

Please find the attached copy of the Soquel Creek Water District (SqCWD) 2010 Draft Urban Water Management Plan (UWMP) for your review. The UWMP is a long-range planning document that focuses on current and projected water supplies and demand, as well as water supply reliability, water shortage contingency planning and conservation. Your agency may rely on the UWMP to evaluate the adequacy of water supplies for land use planning or use the information for other purposes.

Additionally, the SqCWD is providing notice that our Board of Directors will hold a public hearing to receive public comments and consider adoption of the Draft 2010 Urban Water Management Plan (UWMP). Details of the public hearing are as follows:

**Date/Time: Tuesday, September 20, 2011 at 7:00 p.m.**  
**Place: Board of Directors Meeting, SqCWD Office**  
**5180 Soquel Avenue, Soquel, CA**

SqCWD staff anticipates the Board adopting the Draft 2010 UWMP with recommended minor modifications at the September 20, 2011 meeting after hearing public input. If significant modifications are recommended, the Draft 2010 UWMP will be revised and brought back at another Board of Directors meeting for a public hearing and adoption.

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Soquel Creek Water District  
Attn: Shelley Flock, Staff Analyst  
P.O. Box 1550  
Capitola, CA 95010  
Fax: (831) 475-4291; email: [shelleyf@soquelcreekwater.org](mailto:shelleyf@soquelcreekwater.org)

We look forward to receiving your input on this Plan. Should you have any questions, please feel free to contact Ron Duncan, Conservation/Customer Service Field Manager via email at [rond@soquelcreekwater.org](mailto:rond@soquelcreekwater.org) or by phone at (831) 475-8500 ext. 144.

Sincerely,  
SOQUEL CREEK WATER DISTRICT



Laura D. Brown  
General Manager



**Board of Directors**  
Dr. Thomas R. LaHue, *President*  
Bruce Daniels, *Vice President*  
Dr. Don Hoernschemeyer  
Dr. Bruce Jaffe  
Daniel F. Kriege

Laura D. Brown, *General Manager*

September 1, 2011

Central Water District  
ATTN: Mr. Ralph Bracamonte, General Manager  
P.O. Box 1869  
Aptos, CA 95001-1869

**SUBJECT: Notice of Public Hearing to Consider Adoption of the Soquel Creek Water District Draft 2010 Urban Water Management Plan (UWMP) and Availability of Draft 2010 UWMP for Public Review**

Dear Mr. Bracamonte:

The Soquel Creek Water District (SqCWD) is providing notice that our Board of Directors will hold a public hearing to receive public comments and consider adoption of the Draft 2010 Urban Water Management Plan (UWMP). The UWMP is a long-range planning document that focuses on current and projected water supplies and demand, as well as water supply reliability, water shortage contingency planning and conservation. Details of the public hearing are as follows:

**Date/Time: Tuesday, September 20, 2011 at 7:00 p.m.**  
**Place: Board of Directors Meeting, SqCWD Office**  
**5180 Soquel Avenue, Soquel, CA**

SqCWD staff anticipates the Board adopting the Draft 2010 UWMP with recommended minor modifications at the September 20, 2011 meeting after hearing public input. If significant modifications are recommended, the Draft 2010 UWMP will be revised and brought back at another Board of Directors meeting for a public hearing and adoption.

The Draft 2010 UWMP is available for public review on the SqCWD's website at [www.soquelcreekwater.org](http://www.soquelcreekwater.org) or by requesting an electronic copy at [shelleyf@soquelcreekwater.org](mailto:shelleyf@soquelcreekwater.org). Additionally, the Draft 2010 UWMP may be viewed at the SqCWD office located at 5180 Soquel Drive, Soquel, during normal business hours.

Written comments on the Draft 2010 UWMP must be received by 4:00 p.m. on Thursday, September 15, 2011 for inclusion with the Board packet for the public hearing and sent to:

Soquel Creek Water District  
Attn: Shelley Flock, Staff Analyst  
P.O. Box 1550  
Capitola, CA 95010  
Fax: (831) 475-4291; email: [shelleyf@soquelcreekwater.org](mailto:shelleyf@soquelcreekwater.org)

We look forward to receiving your input on this Plan. Should you have any questions, please feel free to contact Ron Duncan, Conservation/Customer Service Field Manager via email at [rond@soquelcreekwater.org](mailto:rond@soquelcreekwater.org) or by phone at (831) 475-8500 ext. 144.

Sincerely,  
SOQUEL CREEK WATER DISTRICT



Laura D. Brown  
General Manager

**Appendix F**  
**Special Outreach to Public**



## **City of Santa Cruz Water Department and Soquel Creek Water District scwd<sup>2</sup> Desalination Program**

### **Monthly Project Update & Latest News – September 2011**

#### **Soquel Creek Water District Releases Final Draft 2010 Urban Water Management Plan – Public Hearing Scheduled for September 20, 2011**

The California Urban Water Management Planning Act requires water agencies that provide more than 3,000 acre-feet annually or have 3,000 or more service connections to develop and adopt an Urban Water Management Plan (UWMP) every five years. On September 1, 2011, Soquel Creek Water District (SqCWD) released a final Draft 2010 Urban Water Management Plan (UWMP) for public review and comment. The UWMP must address specific topics as required by legislation and is formatted according to State specifications. It is a long-range planning document that assesses current water demand, projects future demand over a 20-year planning horizon, and identifies a mix of water resources and conservation efforts to meet future demand. The Draft UWMP also contains details on SqCWD's water shortage contingency planning and drought response actions. The Draft 2010 UWMP is available for public review on the SqCWD's website at [www.soquelcreekwater.org](http://www.soquelcreekwater.org), and at the SqCWD office (5180 Soquel Drive, Soquel) during normal business hours. The public hearing to receive comments on the Draft 2010 UWMP is scheduled for September 20, 2011 at 7:00 p.m. at 5180 Soquel Drive in Soquel. Following the public hearing, the District's Board of Directors will consider adoption of the 2010 UWMP, which will then be filed with the California Department of Water Resources. To access the on-line UWMP and get more information on how to submit comments, visit <http://www.soquelcreekwater.org/content/soquel-creek-water-district-releases-final-draft-2010-urban-water-management-plan-public-hea>.

The City of Santa Cruz's Draft 2010 Urban Water Management Plan will be released in October 2011 for public review and comment. More information will be forthcoming in next month's email update.

#### **Energy Plan Update: Detailed Assessments of Potential Energy/GHG Reduction Projects introduced at September 21 Task Force Meeting**

As stated in last month's email update, the **scwd<sup>2</sup>** Task Force approved 16 potential energy/greenhouse gas reduction projects for further evaluation. These projects include:

- Additional Water Conservation Activities
- Recycled Water Projects
- Residential/Commercial Energy Efficiency and Renewable Rebates

- Graywater Program and Rainstore Water
- Santa Cruz WWTP Energy Audit Results (Improved Mixing)
- Santa Cruz WWTP Energy Audit Results (Other Recommendations)
- Pump and Motor Efficiency Improvement Program
- Food Waste to Energy
- Renewable Purchase
- Local Solar PV Projects
- Solid Oxide Fuel Cells
- Microhydro at Graham Hill WTP
- Hydropower Project at Lake Nacimiento
- GHG Offset Purchases
- Fleet Fuel Consumption/GHG Policy
- Use Recovered CO<sub>2</sub> for RO Permeate Post-Treatment

The 16 project assessments will be introduced to the Task Force at their September 21 meeting with comments and discussions scheduled for the October 19 meeting. The Energy Technical Working Group will also be reviewing these project assessments in late September/early October. For more information, please visit <http://www.scwd2desal.org/Page-Energy.php>

### **Inquisitive Minds Want to Know ...**

*This is an on-going section that will answer frequently asked question(s) related to the proposed desalination project and/or our local water supplies. For more FAQs, please visit the FAQs section of [www.scwd2desal.org](http://www.scwd2desal.org).*

### **Q: Why did the City of Santa Cruz (City) and Soquel Creek Water District (SqCWD) partner to jointly evaluate the proposed desalination project?**

A: The City and SqCWD both have different water supply needs that compliment each other such that a joint project could feasibly be shared by the two agencies. The City's primary supplemental supply needs are to meet shortfalls during drought conditions; SqCWD could use the desalination facility during non-drought conditions to help restore the overdrafted groundwater basin and supplement water demand needs while reducing groundwater pumping. This partnership has allowed the agencies to share the costs associated with further evaluation of this proposed project. The scwd<sup>2</sup> Task Force was formed, comprised of two elected officials from both agencies, to oversee the technical studies and environmental review of the proposed project, to provide a forum for public input on the project, and formulate an agreement and governance structure should the decision be made to proceed with the project.

*You received this email because your email address has been entered into the email distribution list of individuals who are interested in the Integrated Water Plan and **scwd<sup>2</sup>** Desalination Program. If you do not wish to receive emailed updates, you may unsubscribe by emailing [melanies@soquelcreekwater.org](mailto:melanies@soquelcreekwater.org) and typing "Unsubscribe" in the subject line.*

**\*\*Please consider the environment before printing this email. \*\***

**FOR MORE INFORMATION, VISIT [WWW.SCWD2DESAL.ORG](http://WWW.SCWD2DESAL.ORG)**

**Follow us on Twitter at [@scwd2news](https://twitter.com/scwd2news)**

**"Like" our Page on Facebook at [www.facebook.com/scwd2news](http://www.facebook.com/scwd2news)**

**Appendix G**  
**Comments on Draft 2010 UWMP**

**From:** [Ron Duncan](#)  
**To:** [Rick Longinotti](#);  
**CC:** [Shelley Flock](#);  
**Subject:** RE: UWMP draft  
**Date:** Monday, August 01, 2011 8:54:50 AM  
**Attachments:**

---

Rick,

Thanks for clarification.

Ron Duncan  
Conservation and Customer Service Field Manager  
Soquel Creek Water District  
Office phone: 475-8501  
Email: [rond@soquelcreekwater.org](mailto:rond@soquelcreekwater.org)

-----Original Message-----

From: Rick Longinotti [<mailto:longinotti@baymoon.com>]  
Sent: Monday, August 01, 2011 8:51 AM  
To: Ron Duncan  
Cc: Shelley Flock  
Subject: Re: UWMP draft

Hi Ron,

I re-read the section and see that it was just talking about "the direct toilet installation program"

Thanks,  
-Rick

On 8/1/11 8:40 AM, "Ron Duncan" <[RonD@soquelcreekwater.org](mailto:RonD@soquelcreekwater.org)> wrote:

> Rick,  
>  
> First off, thanks for taking time to read the draft UWMP. Community input is  
> important.  
>  
> I think there is some misunderstanding. Maybe we need to reword that section.

> The WDO program has not ended, it is still in operation. The confusion may be  
> that we have stopped allowing developers to do the installations at other  
> customer locations. The District has taken on that responsibility and then we  
> sell the credit to developers.

>

> Thanks - Ron

>

> Ron Duncan

> Conservation and Customer Service Field Manager

> Soquel Creek Water District

> Office phone: 475-8501 144

> Email: [rond@soquelcreekwater.org](mailto:rond@soquelcreekwater.org)

>

> -----Original Message-----

> From: Rick Longinotti [<mailto:longinotti@baymoon.com>]

> Sent: Friday, July 29, 2011 5:34 PM

> To: Ron Duncan

> Subject: UWMP draft

>

> Hi Ron,

> I just got to the part that says the water demand offset program ended in

> 2010. Does that mean that you no longer ask developers for an offset fee?

> Does it mean the Go Green program has ended as well? As I understand it, the

> main financial motivation for Go Green was to achieve a reduction in offset

> fees.

> Also, any reason why Go Green limited the credit for water savings to 15%?

> Why stop there?

>

> Thanks,

> Rick

>

>

> Rick Longinotti, MFT

> 425-0341

>

>

>

>

>

Rick Longinotti, MFT

**From:** [Ron Duncan](#)  
**To:** [Rick Longinotti](#);  
**CC:** [Shelley Flock](#);  
**Subject:** RE: Satellite Reclamation  
**Date:** Wednesday, July 27, 2011 11:00:08 AM  
**Attachments:**

---

Hi Rick,

I appreciate the call and informing us of a possible mistake in the UWMP.

Thanks

Ron Duncan  
Conservation and Customer Service Field Manager  
Soquel Creek Water District  
Office phone: 475-8501  
Email: [rond@soquelcreekwater.org](mailto:rond@soquelcreekwater.org)

---

**From:** Rick Longinotti [mailto:[longinotti@baymoon.com](mailto:longinotti@baymoon.com)]  
**Sent:** Wednesday, July 27, 2011 10:48 AM  
**To:** Ron Duncan  
**Subject:** Satellite Reclamation

Hi Ron,  
Thanks for the conversation this morning. You cleared up my questions.  
Here's the statement from the draft UWMP on page 4-16:  
While the Seascape Golf Course has an adequate supply and meets the engineering requirements, the cost of water was approximately \$7,300 per acre foot. This is substantially higher than the cost of water from a regional seawater desalination plant. Additionally, a SRP at this site would only save about 134 afy, less than 10% of SGC's needed water supply.

This doesn't match the statement in Black & Veatch, 2009, Section

6.1.1:

"The District has indicated that average annual water usage at SGC is closer to 134 AFY (120,000 gpd)."

Also, the cost of desalinated water at Monterey according to the Division of Ratepayer Advocates of the California PUC is pretty close to the satellite reclamation cost: "DRA estimates the cost to Cal Am for Regional Project desalinated water at \$6400 per acre-foot with another \$1500 per acre-foot for conveyance." I've attached the source document.

-Rick

Rick Longinotti, MFT

<http://desalalternatives.org>

831 515-8072

**From:** [Lynn Jackson](#)  
**To:** [Shelley Flock;](#)  
**CC:**  
**Subject:** my opinion  
**Date:** Sunday, September 11, 2011 6:52:41 PM  
**Attachments:**

---

Hello Shelley,

I have gone to most of the meetings, the pilot desal site, and read most of the literature. I am sorry to say I am not in favor of this program as I see it as not a safety measure but a futile effort to control a resource that has been abused and miss understood. I will attend the meeting and will vocally speak my mind. Sincerely Lynn Jackson

**From:** [Don Heichel](#)  
**To:** [Shelley Flock;](#)  
**CC:**  
**Subject:** UWMP COMMENTS  
**Date:** Thursday, September 15, 2011 1:58:55 AM  
**Attachments:**

---

Hi Ms. Flock,

My comments are in yellow highlight, Soquel Creek water dist verbiage is not highlighted by is included for continuity.

Don Heichel

The current average annual demand in the SqCWD service area, based on average annual demand from 2006 through 2010, is 4,615 acre-feet per year (afy)

You give the exact afy on demand WHICH YOU TRICK UP BY OVER 400 afy, yet on supply you fudge.

*However, a study of outflow needed to achieve protective groundwater levels (HydroMetrics LLC, 2009b) concluded that the previous estimate of 4,800 afy was likely hundreds of acre-feet per year too high to protect against seawater intrusion after groundwater*

*levels*

*recover to protective elevations. Recent modeling and evaluations by HydroMetrics*

*WRI (2011) indicate that the sustainable yield in the Purisima is approximately*

*2,500 afy and the sustainable yield in the Aromas is significantly less than the 1,800*

*afy*

**YOU DON'T KNOW WHAT NUMBER OF afy IS SUSTAINABLE YIELD, YOU CAN NOT JUSTIFY DESAL BASED ON IMAGINARY ASSUMPTIONS.**

The groundwater within the Soquel-Aptos area is also a source of supply for the City of Santa Cruz Water Department, Central Water District (CWD), and numerous mutual water companies and private wells. Water production data are generally only available from the public water agencies; however, there has been some effort to extrapolate total production based on land use. It is estimated that SqCWD pumps approximately 60 percent of the total annual groundwater yield from the SoquelAptos area,

with the remaining 40 percent pumped by all other users (Johnson et al., 2004).

YOU ADMIT TO USING 60% OF THE GROUNDWATER, BUT INTEND TO CHARGE ONLY SQ CREEK CUSTOMERS FOR DESAL. THAT IS WRONG!

ALL PRIVATE WELLS ARE COUNTY PERMITTED, THE COUNTY MUST BE INVOLVED IN ANY SUPPLEMENTAL WATER SUPPLY COST!

SqCWD also completed a Well Master Plan and will be developing up to five new wells over the next five or so years to redistribute pumping inland. Additionally, groundwater modeling and evaluations

are still underway to more fully characterize protective elevations and the sustainable yield within portions of the Aromas aquifer used by SqCWD.

FOR THE NEXT FIVE YEARS YOU WILL NOT KNOW WHAT THE SUSTAINABLE YIELD WILL BE & EVEN LONGER WHILE YOU ADJUST PUMPING BETWEEN THE VARIOUS NEW WELLS THAT ARE AWAY FROM THE COAST TO RESEARCH OPTIMUM PUMPING LEVELS.

## Groundwater Management

- Redistribute groundwater pumping to alleviate the potential for saltwater intrusion as identified in the Well Master Plan

(just above Section 2: System Description 2-8 )

Under the WMP, the SqCWD would re-distribute pumping both vertically and horizontally to achieve more uniform drawdown of groundwater in the Soquel-Aptos area, reduce susceptibility to seawater intrusion, and minimize localized pumping depressions.

Consistent with its groundwater management

goals, the WMP states that SqCWD would take actions to limit the pumping from all active wells to no more than 4,800 afy, on average, subject to the constraints of meeting water demand within each of SqCWD's four service areas and the limited capacity to transfer water between service areas.

Based on recent evaluations of the state of the groundwater basin and predictions on recovery and sustainability (HydroMetrics WRI, 2011), all of the cumulative benefits from the actions described above will not alleviate the need to develop a supplemental supply sufficient to:

- 1) Restore protective groundwater levels by limiting groundwater pumping.
- 2) Maintain protective groundwater levels for the long-term.

The proposed regional seawater desalination project with the City of Santa Cruz continues to be the preferred alternative for a supplemental supply and is undergoing continued evaluation through the preparation of an EIR, which is planned for completion in 2012.

UWMP 2010 DRAFT

## Section 2: System Description

2-10

YOU'RE NOT CONSISTENT WITH THE FACTS. FIRST YOUR HYDROLOGIST SAID YOU MAY GAIN SUPPLY THROUGH THE WELL MASTER PLAN (WMP) IMPLEMENTATION.

OH NO YOU SAID & PREPARED A LETTER TO DENY HE MEANT THAT; NOW YOU HAVE FOLLOWED WITH A STUDY TO SHOW THE WMP WILL NOT DO THE JOB... WHY THEN DO I FIND A LETTER FROM SANTA CRUZ WATER DEPT IN THE APPENDIX OF THE WELL MASTER PLAN EIR ALSO STATING YOU MAY GAIN SUPPLY IMPLEMENTING THE WELL MASTER PLAN!

YOU ARE PLAYING "SIN OF OMISSION" ON INFO WITH YOUR CUSTOMERS WHILE STICKING THEM WITH ALL THE COST OF THE MOST EXPENSIVE SUPPLEMENTAL WATER SUPPLY KNOWN ON EARTH.

In order to recover groundwater levels to protective elevations and eliminate overdraft, SqCWD must reduce pumping to levels below the sustainable yield (HydroMetrics WRI, 2011) and other pumpers

must not further impact the overdrafted portion of the basin.

WHY DO ONLY SQ CREEK CUSTOMERS CUT BACK? IN THE gmp 2007 YOU IDENTIFY FEARS OF SALT WATER INTRUSION FROM SEASCAPE GOLF COURSE BECAUSE THEIR WELLS ARE SO CLOSE TO THE BAY; WHAT IS THE CURRENT POLICY ON THIS SPECIFIC ISSUE?

HOW CAN THESE WELLS BE ALLOWED TO CONTINUE PUMPING WHILE SQ CREEK CUSTOMERS ARE THE ONLY ONES TO CUT BACK & PAY FOR SUPPLEMENTAL WATER?

7-3

Lastly, increases in temperature would increase plant evapotranspiration and lead to greater water demand. A 2006 report by the California Climate Change Center indicates that temperatures in California are projected to increase by at least 3 degrees Fahrenheit up to 10.5 degrees Fahrenheit, depending upon the rate of future greenhouse gas emissions.

WHAT IS ASTOUNDING IS YOU DO NOT ADDRESS THE GHG EMISSIONS REQUIRED TO DESALINATE RAW SEA WATER. WHY ARE THESE NOT GIVEN MORE WEIGHT IN CONSIDERING DESAL?

To prepare for these future challenges, SqCWD must continue to pursue a multi-phased adaptive approach by identifying strategies to mitigate GHG emissions associated with water production

HOW DOES DESAL MITIGATE GHG EMISSIONS?!? WHAT IS WITH THIS "SIN OF OMISSION"? IT IS THE BIGGEST USER OF ELECTRICITY YOU CAN CHOSE FOR SUPPLEMENTAL WATER SUPPLY.

### Existing Water Sources

The SqCWD currently relies solely on groundwater from aquifers located within two geologic formations that underlie the SqCWD service area. The Purisima Formation (Purisima) provides about two-thirds of the SqCWD's annual average production of 4,615 acre-feet (af) (based on 2006-2010 production data), whereas the Aromas Red Sands (Aromas) aquifer typically provides the remaining one-third of the annual average production.

WHY DO YOU FAIL TO MENTION THAT 85% OF THE WATERSHED'S RAIN  
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WHY DO YOU FAIL TO FOLLOW UP ON DR. FISHERS COMMENT TO THE BOARD IN  
MAY 2008 THAT HE ENVISIONED A SYSTEM OF INJECTION WELLS IN THE HILLS FOR  
RAIN HARVESTING?

YOU CAN ALWAYS COME BACK TO DESAL, IT WILL ALWAYS BE AN AVAILABLE,  
EXPENSIVE, CO2 INTENSIVE SOURCE OF SUPPLEMENTAL WATER; YOUR FOCUS  
SHOULD BE COMPLETING THE WELL MASTER PLAN, RESEARCHING BEST  
PUMPING LEVELS FOR THE NEW WELLS & FINDING WAYS TO HARVEST RAIN IN  
THE PRIMARY AQUIFER RECHARGE AREAS THE COUNTY HAS ALREADY MAPPED.

ADDITIONALLY THE MONTEREY BAY NATIONAL MARINE SANCTUARY HAS A PDF  
ON-LINE THAT INDICTS EROSION OF OUR WATERSHED AS A POLLUTION SOURCE  
FOR THE

BAY BECAUSE SOIL ERODED CARRIES DDT; THEY SAY ON THE LAST PAGE OF

THEIR PDF, KEEP SEDIMENT FROM WASHING INTO THE OCEAN.

[http://montereybay.noaa.gov/sac/2008/081508/081508hardin\\_ppt.pdf](http://montereybay.noaa.gov/sac/2008/081508/081508hardin_ppt.pdf)

HARVESTING RAIN WILL REDUCE EROSION, DESAL WILL NOT!



**SOQUEL CREEK  
WATER DISTRICT**

**Board of Directors**

Dr. Thomas R. LaHue, *President*  
Bruce Daniels, *Vice President*  
Dr. Don Hoernschemeyer  
Dr. Bruce Jaffe  
Daniel F. Kriege

Laura D. Brown, *General Manager*

September 21, 2011

Mr. Lynn Jackson  
216 Central Avenue  
Capitola, CA 95010

Subject: Response to September 11, 2011 Email Correspondence to Soquel Creek Water District (SqCWD) Staff Regarding the SqCWD Draft 2010 Urban Water Management Plan

Dear Mr. Jackson,

Thank you for sharing your thoughts on the supplemental supply component of Soquel Creek Water District's (SqCWD) 2010 Draft Urban Water Management Plan (UWMP). We appreciate your interest in and dedication to our local water supply issues and conservation programs.

The Draft 2010 UWMP projects future demand over a 20-year planning horizon and identifies a mix of water resources and conservation to meet future demand. Even with projected population growth, the plan projects an 8% reduction in water demand between 2015 and 2030 due to continued conservation and other factors. Unfortunately, this substantial water use reduction, coupled with significant water savings already achieved, is negligible in regards to stabilizing the problem of groundwater overdraft while continuing to meet demand. A supplemental supply that can reliably produce at least 1,400 acre-feet per year on average is needed in combination with continued conservation and redistributing groundwater inland away from the coast.

As discussed in the Draft 2010 UWMP, SqCWD has evaluated numerous potential supplemental supply options over the last 20 years. As a result of these studies and evaluations, SqCWD adopted an Integrated Resources Plan in 2006 that identifies seawater desalination as the preferred supplemental supply alternative. The Draft 2010 UWMP simply reiterates the mix of water resources that were identified in the adopted IRP. However, we remain open to considering viable alternatives or enhancements to desalination that can both achieve groundwater basin recovery and maintain future pumping within the sustainable yield. If other alternatives that meet these objectives are identified in the future, both the IRP and the UWMP will be updated.

Thank you for sharing your thoughts and ideas on SqCWD's 2010 UWMP. We appreciate your interest in and dedication to our local water supply issues.

Sincerely,

SOQUEL CREEK WATER DISTRICT

Shelley Flogk  
Staff Analyst

Ron Duncan  
Conservation and Customer Service Field Manager



September 21, 2011

Mr. Rick Longinotti  
Santa Cruz Desal Alternatives  
157 Trescony Street  
Santa Cruz, CA 95060

Subject: Response to September 6, 2011 Email Correspondence to Soquel Creek Water District (SqCWD) Board of Directors and Staff Regarding the SqCWD Draft 2010 Urban Water Management Plan

Dear Mr. Longinotti:

Thank you for the subject correspondence you sent on behalf of Santa Cruz Desal Alternatives (SCDA) regarding suggested recommendations on the Soquel Creek Water District (SqCWD) Draft 2010 Urban Water Management Plan (UWMP). We appreciate your approval of the projected demand reduction contained in the Plan. Please find our responses to each SCDA recommendation below.

**Transfers with the City of Santa Cruz**

1) SCDA Recommendation: On page 4-13 there is a description of "Transfer Opportunities". We make the following recommendations for revision to this section:

Delete the following sentence, "SqCWD does not foresee the transfer of groundwater out of the service area on a short-term or long-term basis due to existing overdraft conditions." Replace it with *A water transfer agreement with Santa Cruz is not politically feasible without some assurance from SqCWD that it would transfer water to Santa Cruz in the event of a critical drought. Despite the fact that it may take many years for SqCWD to replenish depleted aquifers, in the short term it could be highly advantageous to aquifer recovery for SqCWD to receive water from Santa Cruz nearly every winter in exchange for an export of water to Santa Cruz on an occasional basis (Santa Cruz classifies one in 7 years in the 90 year historical record as a "critical drought" year).*

**SqCWD Response:**

Staff will propose to the Board to modify the section to read:

*Although SqCWD will continue to pursue potential water transfer opportunities, we SqCWD does not do not currently foresee the transfer of groundwater out of the service area on a short-term or long-term basis due to existing overdraft conditions and the absence of a supplemental supply. However, the only situation in which on a short-term basis, we may transfer water through existing interties to support CWD, the City of Santa Cruz or adjoining mutuals in the event of an emergency. Supplemental supply projects currently being evaluated (i.e., the desalinated water and/or the regional surface water transfer opportunities described below) could possibly allow future transfers without dangerously exacerbating groundwater overdraft, but the feasibility, frequency and volume of such transfers have not yet been determined.*

SCDA recommendations regarding long-term water transfers with the City of Santa Cruz during critical drought are addressed in SqCWD text revisions shown below (in response to SCDA Recommendation #2).

2) SCDA Recommendation: After this sentence, "Preliminary estimated yield to SqCWD from the conceptual water transfer from the City of Santa Cruz is an average of 340 afy," add:

*The preliminary conceptual work done by the County proposes Scotts Valley Water District as first in line to receive exports of winter water from Santa Cruz. The rationale for this prioritization is the fact that Scotts Valley lies within the San Lorenzo River watershed. Reduced pumping in Scotts Valley will improve base flows in, Bean Creek, a tributary of the San Lorenzo River. SqCWD may be able to persuade County and fisheries agencies that it is better qualified for first priority for Santa Cruz winter flows for the following reasons:*

- *Base flows in SqCWD area creeks will also benefit from aquifer recharge.*
- *SqCWD has a water-neutral development policy that guarantees that water imported from Santa Cruz will go to aquifer recharge and not growth. Scotts Valley does not have an equivalent policy.*
- *SqCWD is willing to export water to Santa Cruz in the event of critical drought according to an agreement whereby a portion of that water will offset water to remain in Santa Cruz creeks for fish habitat.*

**SqCWD Response:**

Staff will propose to the Board that the following text shown in italics be added:

*Preliminary estimated yield to SqCWD from the conceptual water transfer from the City of Santa Cruz is an average of 340 afy. This is only about 20% of the amount of supplemental supply needed to recover and sustain the groundwater basin. The estimated yield is based on the SCCEH's assumption that Scotts Valley Water District would have the higher priority for receiving water because: (1) The underlying Santa Margarita groundwater basin is in the same watershed as the San Lorenzo River; (2) The Santa Margarita basin is a smaller basin that would recover more quickly with reductions in pumping; and (3) A recovery of groundwater levels in the Santa Margarita basin would allow for more immediate fish benefits in terms of increased summer baseflow in Bean Creek (a tributary of the San Lorenzo River).*

*It is currently unknown whether SqCWD would be able to negotiate a higher allocation of water. In addition to the relatively low yield that may be available to SqCWD based on the assumed allocation priority, there are a number of uncertainties associated with a water transfer that still require further evaluation, including but not limited to the following: minimum stream flows required for fish habitat; the process and length of time required to amend the point of use within the City of Santa Cruz's existing water rights; and future effects of climate change on precipitation, runoff and recharge.*

While a future surface water transfer may potentially constitute a small portion of SqCWD's overall supply portfolio, additional studies *and time* are needed to further evaluate uncertainties, *refine total yield estimates and allocation priorities*, perform cost-benefit analyses *and evaluate the feasibility and impacts of exporting water from the Soquel-Aptos Area to the City of Santa Cruz during critical drought*. The SCCEH plans to continue studying this option, as well as other conjunctive use projects within the region. SqCWD will continue to assist the SCCEH by providing relevant information in support of these efforts, *and, as a partner agency in the Northern Santa Cruz County Integrated Water Management Region along with SCCEH, City of Santa Cruz and Scotts Valley Water District, SqCWD will be in a position to support and benefit from any grant funding to implement the proposed surface water transfer project.*

3) SCDA Recommendation: Add to this section:

*SqCWD recognizes that the State of California offers grant funding for "conjunctive use" for the purpose of aquifer recharge (see California Water Plan, 2005, Volume 2 Ch 4, "Conjunctive Management and Groundwater Storage"). SqCWD will actively pursue grant funding for this purpose.*

**SqCWD Response:** The response to this recommendation is addressed above in #2.

**Water Demand Offset Program**

1) SCDA Recommendation: The expected saturation of the program's toilet replacement capacity indicates a need to modify the program so that it can operate successfully for as long as possible into the future. This may be accomplished through increasing the incentive for builders to reduce on-site water demand. Currently, the Go Green Program allows developers to earn credits for on-site installation of water saving measures, allowing them to reduce their off-site demand-offset requirement. The current Go Green limit for on-site credits is 15%. This limit should be raised or eliminated.

**SqCWD Response:** The Go Green Program for new development does not limit Water Demand Offset (WDO) credits to 15%. The most cost-effective way to earn credits (i.e., by installing Ultra-High Efficiency Toilets ( $\leq 0.8$  gallons per flush),  $\leq 1.5$  gallon per minute (gpm) showerheads,  $\leq 1.0$  gpm bathroom faucets and no turf /no overhead spray irrigation in landscape areas) allows developers to save 14.6% in WDO fees.

Additionally, developers may further reduce WDO fees by installing other water efficient features such as graywater systems, weather-based irrigation controllers, clothes washing machines that have a Water Factor of 4.5 or less, and hot water recirculation systems. Finally, developers may also propose other water saving devices or techniques that SqCWD will evaluate on a case-by-case basis to determine the estimated water savings and WDO credit eligibility. Staff will evaluate if the literature promoting this portion of the program needs to be made clearer or easier to understand.

2) SCDA Recommendation: According to an interview with the CEO of an Australian water tank company, rainwater harvesting is "mandatory for any remodeling or new building in most states throughout Australia." SqCWD could explore collaborating with area jurisdictions to mandate rainwater harvesting in new construction. In the meantime,

the District could help developers connect with grant funding sources and experts in rainwater harvesting and graywater systems.

**SqCWD Response:** SqCWD has met with both land use planning jurisdictions within our service area (i.e., the City of Capitola and Santa Cruz County) to discuss the practicality of mandating dual plumbing for graywater in new development. The consensus was that since the use of graywater requires active participation by the occupant(s) of the development to ensure proper use (e.g., only certain soaps and cleaners may be used or the system has to be manually diverted to sanitary sewer, the system should be diverted during the rainy season when outdoor irrigation is not necessary, etc.), and proper use cannot be feasibly enforced, mandatory dual plumbing for graywater could cause harm to the environment. Instead, SqCWD will evaluate new commercial development to determine whether the use of graywater may be appropriate and feasible. If so, SqCWD will suggest that the developer consider the installation of a graywater system, and will assist the developer as needed. As noted above, developers can voluntarily exercise this option to install graywater (where legal) and obtain water offset credit from SqCWD.

Staff has evaluated requiring rainwater harvesting for new construction, but the analysis revealed it to be the least cost-effective of all the methods evaluated (partially due to our local rainfall patterns). However, SqCWD offers rebates to new and existing development to encourage rain catchment. Note that the District has one 3,000 gallon rain tank installed (and more planned) at its main office. SqCWD will continue to work with developers who may want to install rain catchment systems and to identify potential sources of grant funding.

**Coordinated demand reduction with other users of the aquifers.**

1) SCDA Recommendation: The consensus of the Board of Directors of SqCWD appears to be that there is a need to collaborate with all users of the aquifers to reduce pumping to sustainable rates. This intention needs to be implemented within the UWMP.

The only reference we could find of coordinated demand reduction in the draft UWMP is in Section 5 dealing with protocols for declaring a groundwater emergency due to groundwater overdraft:

*Prior to declaring a groundwater emergency, the SqCWD shall consult with neighboring water agencies, such as the Pajaro Valley Water Management Agency, Central Water District, City of Santa Cruz, and the County of Santa Cruz to explore joint options and/or programs that could be undertaken or adopted to possibly defray the need for such a declaration. If a cooperative effort cannot successfully address the concerns, then consideration will be given to declaring a groundwater emergency.*

The draft is not clear that this inter-agency collaboration should take place at this time, even though the criteria for declaring a groundwater emergency appear to be met:

*Where it is demonstrated by a professional hydrologist that the groundwater basin is experiencing groundwater overdraft exceeding the sustainable yield and where such degradation threatens the public health, safety and welfare of the community, a groundwater emergency may be declared.*

The draft appears to offer an “escape clause” that nullifies the requirement to declare a groundwater emergency.

*If a sufficient supplemental supply to address the issue is readily available to come online in the near future, then the Board may consider that declaring a groundwater emergency is not necessary.*

This sentence is ambiguous. What does “address the issue” mean? We are not clear whether a supplemental supply is meant to allow the aquifer to be restored to safe levels, or whether it is meant to supplant the aquifer as a source of supply while the aquifer further deteriorates due to overdraft by all users.

The latter interpretation is supported by a subsequent section:

*A groundwater emergency shall be rescinded by resolution of the Board of Directors after a public hearing when one of the following findings is made:*

*Alternative water sources which compensate for the existing overdraft and supply the affected area are developed...*

This sentence indicates that the overdraft would continue to exist while the alternative water sources “compensate” for it by supplying the affected area. It is this scenario that Santa Cruz Desal Alternatives is most concerned about. Under this scenario, the Aromas Aquifer would eventually be lost to salinity and the residents of that area would be permanently dependent on expensive imported water.

We recommend that the UMWP Section 5 make an unequivocal statement that a groundwater emergency is warranted until such time as the aquifer is making substantial progress towards recovering safe levels. We believe that it is only by adopting such a policy that the Soquel Creek Water District UWMP can adequately protect the water supply of its customers.

#### **SqCWD Response:**

Groundwater management authority must be legally established through the provisions of California Water Code §10753 et. seq. known as the AB3030 Groundwater Management Act (AB3030). Soquel Creek Water District and Central Water District entered into a Joint Powers Agreement (JPA) to establish the groundwater management authority for the Soquel-Aptos area and, in accordance with AB3030, adopted “Groundwater Management Plan – 2007; Soquel-Aptos Area” (GWMP). The GWMP includes elements for interagency coordination (which includes cooperatively managing the groundwater aquifers and supporting implementation of Pajaro Valley Water Management Agency’s Basin Management Plan) and to identify and manage cumulative impacts (which includes encouraging sustainable pumping from non-agency groundwater users.) The GWMP is being actively implemented as documented in the Soquel-Aptos Area Groundwater Management Annual Review and Report. Interagency collaboration during water shortages is presented as part of Table 5-9 in the UWMP.

The Groundwater Overdraft provision of the UWMP recognizes that in taking any action to declare a groundwater emergency, the District’s Board of Directors must act within the authority established by AB3030. Independent of the Groundwater Management JPA, the

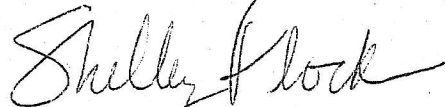
District does not have legal authority to regulate any non-district pumping even that which occurs within its jurisdiction.

Your concern that the language in the UWMP implies a District policy that would allow groundwater overdraft to continue unabated and cause the Aromas Aquifer to eventually be lost to salinity while District customers are dependent on expensive new sources of supply is unfounded. Your statement that groundwater overdraft would be allowed to continue unabated overlooks the point that a supplemental supply would provide in-lieu recharge to eventually recover groundwater levels that are protective against seawater intrusion. Since the majority of groundwater pumping within the Soquel-Aptos area, particularly near the coast, is by SqCWD, we have the greatest potential to address the threat of seawater intrusion by limiting our pumping. The UWMP clearly sets forth that most of the water for District customers will continue to be groundwater. Rates are uniformly set throughout the District, so even though some areas may receive a greater amount of supplemental supply to address localized groundwater issues, rates are based on system-wide costs to produce and deliver water. Furthermore, the Soquel-Aptos Groundwater Management JPA is exploring formation of a groundwater replenishment district whereby non-District groundwater users within the zone of benefit created by the in-lieu recharge resulting from the District's use of a supplemental supply would contribute proportionally to the costs of that program.


Thank you for sharing your thoughts and ideas on SqCWD's 2010 UWMP. We appreciate your interest in and dedication to our local water supply issues.

Sincerely,

SOQUEL CREEK WATER DISTRICT



Shelley Flock  
Staff Analyst



Ron Duncan  
Conservation and Customer Service Field Manager



**Board of Directors**

Dr. Thomas R. LaHue, *President*  
Bruce Daniels, *Vice President*  
Dr. Don Hoernschemeyer  
Dr. Bruce Jaffe  
Daniel F. Kriege

Laura D. Brown, *General Manager*

September 21, 2011

Mr. Don Heichel  
3311 Maplethorpe Lane  
Soquel, CA 95073

Subject: Response to September 15, 2011 Email Correspondence to Shelley Flock of Soquel Creek Water District (SqCWD) Regarding the SqCWD Draft 2010 Urban Water Management Plan

Dear Mr. Heichel:

Thank you for your comments regarding the Soquel Creek Water District (SqCWD) Draft 2010 Urban Water Management Plan (UWMP). We have excerpted your email comments and responded to each one below. Your complete email is attached.

Comment 1

You give the exact afy on demand WHICH YOU TRICK UP BY OVER 400 afy, yet on supply you fudge.

SqCWD Response to Comment 1

The demand for 2009 and 2010 was 4,262 af and 4,080 af, respectively. These demand values are believed to be artificially low due to a variety of factors (e.g. economy, low occupancy, drought curtailment, etc.) that are fully explained in Section 4, pages 4-2 and 4-3 of the Draft 2010 UWMP. Unfortunately, it is not possible to accurately estimate the total reduction in demand resulting from these temporary factors versus sustainable conservation actions. Therefore, in order to responsibly project future demand with any degree of confidence, it is necessary to use a baseline value that best represents "normal" conditions. Staff and the Board visited this topic of baseline demand several times and agreed upon the rationale presented in the Board Memo dated August 9, 2011 (Item 5.3).

Please note that we could have taken a variety of approaches to calculate baseline demand, including but not limited to the use of a multi-year average which could have resulted in a baseline higher than 4,610 afy.

We do not understand your comment "yet on supply you fudge". Our goal in preparing the UWMP is to provide the best information available and to cite the basis for assumptions when data is unavailable.

Comment 2

YOU DON'T KNOW WHAT NUMBER OF afy IS SUSTAINABLE YIELD, YOU CAN NOT JUSTIFY DESAL BASED ON IMAGINARY ASSUMPTIONS

SqCWD Response to Comment 2

You are correct that we do not currently know the exact sustainable yield value; however, we do know that it is significantly less than previously thought. Groundwater management, especially given the geologic formations and coastal environment within the Soquel-Aptos area, is complicated by many unknowns. Definitive answers for how much is required to

recover the current overdraft and what the sustainable level of pumping could be subsequent to basin recovery will only be available after responsive actions have been implemented. There is consensus among experts, however, that a combination of a supplemental supply, ongoing conservation, and redistribution of pumping inland will all be needed.

Comment 3

YOU ADMIT TO USING 60% OF THE GROUNDWATER, BUT INTEND TO CHARGE ONLY SQ CREEK CUSTOMERS FOR DESAL. THAT IS WRONG!

SqCWD Response to Comment 3

The 60% value is an estimate based on a 2004 report (Johnson et al.). As mentioned in the Draft 2010 UWMP, the groundwater within the Soquel-Aptos area is also a source of supply for the City of Santa Cruz, Central Water District, and numerous mutual water companies and private wells. Unfortunately, water production data are generally only available from the public water agencies thereby requiring that estimates be made.

Under California groundwater law, private wells have a priority right over municipal pumpers such as SqCWD. SqCWD does not have legal authority to charge non-District customers for water use; however, the Soquel-Aptos Area Groundwater Management Joint Powers Authority (JPA) does have the authority to create a water replenishment district. In that manner, the JPA may impose equitable annual fees and assessments for groundwater management based on the amount of groundwater extracted to pay for costs of replenishment water, administration and operation, and capital facilities necessary to implement the groundwater management plan. To do so, the JPA must hold an election in the manner prescribed by law and would be authorized to assess fees only if a majority vote is in favor. SqCWD has presented a proposal to the JPA to form a groundwater replenishment district covering the area that is benefitting from groundwater management efforts, and the specifics necessary for creating such a district are being developed. In the meantime, SqCWD has the responsibility to provide sufficient water supply to meet our customers' current and future beneficial uses, which is the premise for proceeding with implementation of the Integrated Resources Plan.

Comment 4

ALL PRIVATE WELLS ARE COUNTY PERMITTED, THE COUNTY MUST BE INVOLVED IN ANY SUPPLEMENTAL WATER SUPPLY COST!

SqCWD Response to Comment 4

We are working in cooperation with the County on the water supply issue; however, we are unfamiliar with any legal requirement for the County to contribute to the cost of developing a supplemental water supply. Please see response to Comment 3.

Comment 5

FOR THE NEXT FIVE YEARS YOU WILL NOT KNOW WHAT THE SUSTAINABLE YIELD WILL BE & EVEN LONGER WHILE YOU ADJUST PUMPING BETWEEN THE VARIOUS NEW WELLS THAT ARE AWAY FROM THE COAST TO RESEARCH OPTIMUM PUMPING LEVELS

SqCWD Response to Comment 5

As indicated in the response to Comment 2, definitive answers for how much is required to recover the current overdraft and what the sustainable level of pumping could be subsequent to basin recovery will only be available after responsive actions have been implemented; however, the experts have consistently concluded that the groundwater basin cannot support user demand and that a substantial supplemental supply is needed regardless of the pumping configuration.

Comment 6

YOU'RE NOT CONSISTENT WITH THE FACTS. FIRST YOUR HYDROLOGIST SAID YOU MAY GAIN SUPPLY THROUGH THE WELL MASTER PLAN (WMP) IMPLEMENTATION.

OH NO YOU SAID & PREPARED A LETTER TO DENY HE MEANT THAT; NOW YOU HAVE FOLLOWED WITH A STUDY TO SHOW THE WMP WILL NOT DO THE JOB... WHY THEN DO I FIND A LETTER FROM SANTA CRUZ WATER DEPT IN THE APPENDIX OF THE WELL MASTER PLAN EIR ALSO STATING YOU MAY GAIN SUPPLY IMPLEMENTING THE WELL MASTER PLAN!

YOU ARE PLAYING "SIN OF OMISSION" ON INFO WITH YOUR CUSTOMERS WHILE STICKING THEM WITH ALL THE COST OF THE MOST EXPENSIVE SUPPLEMENTAL WATER SUPPLY KNOWN ON EARTH.

Response to Comment 6

The 2007 Soquel-Aptos Area Groundwater Management Plan (GWMP) clearly and consistently states that both redistributing pumping to disperse the basin's overall drawdown and developing a supplemental source of supply are elements for achieving the basin management goals and objectives. There has not been any new information or other reason since the adoption of the GWMP to withdraw either of those elements.

Comment 7

WHY DO ONLY SQ CREEK CUSTOMERS CUT BACK? IN THE gmp 2007 YOU IDENTIFY FEARS OF SALT WATER INTRUSION FROM SEASCAPE GOLF COURSE BECAUSE THEIR WELLS ARE SO CLOSE TO THE BAY; WHAT IS THE CURRENT POLICY ON THIS SPECIFIC ISSUE?

HOW CAN THESE WELLS BE ALLOWED TO CONTINUE PUMPING WHILE SQ CREEK CUSTOMERS ARE THE ONLY ONES TO CUT BACK & PAY FOR SUPPLEMENTAL WATER?

SqCWD Response to Comment 7

We could not locate a reference in the 2007 GWMP to "fears of saltwater intrusion from Seascape Golf Course wells." Seascape Golf Course, as well as other large, non-District users including Cabrillo College, Trout Gulch and PureSource Mutual Water Companies and Seascape Greens, have been cooperatively working to improve water use efficiency and

implement conservation opportunities. Please see response to Question 3 for more information.

Comment 8

WHAT IS ASTOUNDING IS YOU DO NOT ADDRESS THE GHG EMISSIONS REQUIRED TO DESALINATE RAW SEA WATER. WHY ARE THESE NOT GIVEN MORE WEIGHT IN CONSIDERING DESAL?

SqCWD Response to Comment 8

The UWMP is not the appropriate document to address potential environmental impacts from the proposed desalination project. The draft Environmental Impact Report (EIR) for the desalination facility will evaluate greenhouse gas emission impacts and corresponding mitigation measures and will be available for public review and comment prior to adoption.

Comment 9

WHY DO YOU FAIL TO MENTION THAT 85% OF THE WATERSHED'S RAIN DISAPPEARS EACH YEAR? IT'S IN THE GMP 2007, PAGE 10

WHY DO YOU FAIL TO MENTION THAT THE SOQUEL CREEK DIVERSION WAS NOT TERMINATED FROM LACK OF RAINFALL; YOUR CHARTS SHOWED THERE WAS PLENTY OF RAIN TO SUPPLEMENT GROUNDWATER WITH EXCEPT FOR AN OCCASIONAL VERY DRY YEAR.

WHY DO YOU FAIL TO FOLLOW UP ON DR. FISHERS COMMENT TO THE BOARD IN MAY 2008 THAT HE ENVISIONED A SYSTEM OF INJECTION WELLS IN THE HILLS FOR RAIN HARVESTING?

YOU CAN ALWAYS COME BACK TO DESAL, IT WILL ALWAYS BE AN AVAILABLE, EXPENSIVE, CO2 INTENSIVE SOURCE OF SUPPLEMENTAL WATER; YOUR FOCUS SHOULD BE COMPLETING THE WELL MASTER PLAN, RESEARCHING BEST PUMPING LEVELS FOR THE NEW WELLS & FINDING WAYS TO HARVEST RAIN IN THE PRIMARY AQUIFER RECHARGE AREAS THE COUNTY HAS ALREADY MAPPED.

ADDITIONALLY THE MONTEREY BAY NATIONAL MARINE SANCTUARY HAS A PDF ON-LINE THAT INDICTS EROSION OF OUR WATERSHED AS A POLLUTION SOURCE FOR THE

BAY BECAUSE SOIL ERODED CARRIES DDT; THEY SAY ON THE LAST PAGE OF THEIR PDF, KEEP SEDIMENT FROM WASHING INTO THE OCEAN.

[http://montereybay.noaa.gov/sac/2008/081508/081508hardin\\_ppt.pdf](http://montereybay.noaa.gov/sac/2008/081508/081508hardin_ppt.pdf)

HARVESTING RAIN WILL REDUCE EROSION, DESAL WILL NOT!

SqCWD Response to Comment 9

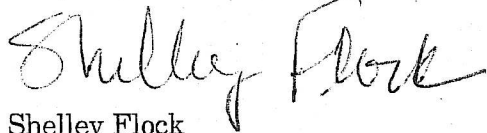
The UWMP is not the appropriate document to re-analyze evaluations and determinations that were made through the multiple-year, public process that resulted in the Integrated

Resources Plan (IRP) that is being implemented. There has not been any new, credible information that would warrant changing the preferred alternative identified in the IRP.

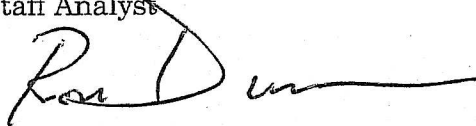
Thank you for sharing your thoughts and ideas on SqCWD's 2010 UWMP. We appreciate your interest in and dedication to our local water supply issues.

Sincerely,

SOQUEL CREEK WATER DISTRICT

A handwritten signature in cursive script, reading "Shelley Flock".

Shelley Flock  
Staff Analyst

A handwritten signature in cursive script, reading "Ron Duncan".

Ron Duncan  
Conservation and Customer Service Field Manager

**Appendix H**  
**Copy of Resolution No. 11-26**  
**Adoption, Filing & Implementation of the**  
**2010 Urban Water Management Plan**

**RESOLUTION NO. 11-26**

**RESOLUTION OF THE BOARD OF DIRECTORS OF THE  
SOQUEL CREEK WATER DISTRICT  
ADOPTION, FILING & IMPLEMENTATION OF THE  
2010 URBAN WATER MANAGEMENT PLAN**

WHEREAS, the California Legislature enacted Assembly Bill No. 797 during the 1983-1984 Regular Session of the California Legislature (Water Code Section 10610, et. seq.), known as the Urban Water Management Planning Act, and as amended subsequently, which mandates that every supplier providing water for municipal purposes to more than 3,000 service connections or supplying more than 3,000 acre feet of water annually, prepare an Urban Water Management Plan, the primary objective of which is to plan for the conservation and efficient use of water; and

WHEREAS, AB 797 requires that said Plan be adopted by December 31, 1985, after public review and hearing, and filed with the California Department of Water Resources within thirty days of adoption; and

WHEREAS, the SOQUEL CREEK WATER DISTRICT did prepare and file said Plan with the California Department of Water Resources in December 1985; and

WHEREAS, AB 797 requires that said Plan be periodically reviewed at least once every five years, and that the urban water supplier shall make any amendments or changes to its Plan which are indicated by the review; and

WHEREAS, the District is an urban supplier of water providing water to over 14,000 service connections, and has, therefore, prepared and circulated for public review a Draft Urban Water Management Plan Update, in compliance with the requirements of AB 797, and a properly noticed public hearing regarding said Draft Plan Update was held by the District Board on September 20, 2011, and a Final Plan prepared.

NOW, THEREFORE, BE IT RESOLVED by the Board of Directors of the SOQUEL CREEK WATER DISTRICT as follows:

1. The 2010 Urban Water Management Plan Update is hereby adopted and ordered filed with the Secretary of the Board;
2. The District Manager is hereby authorized and directed to file the Plan Update with the California Department of Water Resources within 30 days after this date, in accordance with AB 797;

3. The District Manager is hereby authorized and directed to implement the water conservation programs as detailed in the adopted Urban Water Management Plan Update, including recommendations to the District Board regarding necessary procedures, rules and regulations to carry out effective and equitable water conservation programs. Such steps will include further improvement of water use efficiency in all landscape areas under the District's control.

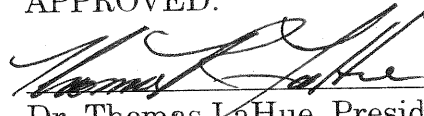
PASSED AND ADOPTED by the Board of Directors of the Soquel Creek Water District this 20th day of September, 2011, by the following vote:

AYES: Directors LaHue, Daniels, Hoernschemeyer

NOES: None

ABSENT: Directors Kriege, Jaffe

APPROVED:



Dr. Thomas LaHue, President

ATTEST:



Denise Alexander, Board Clerk

**Appendix I**  
**AMBAG U.S. Census-Based Population Estimates for 2000, 2005 and 2010,**  
**and Associated Methodology**

RECEIVED

APR 1 2011



S.C.W.D.

ASSOCIATION OF MONTEREY BAY AREA GOVERNMENTS

March 28, 2011

Shelley Flock  
 Soquel Creek Water District  
 P.O. Box 1550  
 Capitola, CA 95010

Dear Ms. Flock,

Below you will find Census population figures for the Soquel Creek Water District Service Area. Please note the following are estimates only as the service area does not neatly align with Census boundaries. The methodology used to obtain these estimates is included in the attached memo.

Soquel Creek Water District Service Area					Unincorporated Santa Cruz County	
Census Year	Population using BGs	Percent Change	Population using Blocks	Percent Change	Population	Percent Change
1990	39,392				130,086	
2000	40,227	2%	38,403		135,326	4.0%
2010	38,876	-3%	37,720	-2%	129,739	-4.1%

Sincerely,

Anais Schenk  
 Planner  
 831-264-5088

Planning Excellence!



## ASSOCIATION OF MONTEREY BAY AREA GOVERNMENTS

### MEMORANDUM

**TO:** Shelley Flock, Soquel Creek Water District  
**FROM:** Anais Schenk, Planner  
**SUBJECT:** Methodology for SCWD Census Population Figure

#### BACKGROUND/DISCUSSION:

The population for this area was developed at the Block Group level for the year 1990 because population data is not available at the Block level for 1990. The population for 2000 and 2010 was derived using the same method as was used for the 1990 population and was completed at both the Block Group and Block level.

1. Selected Block Groups (BGs) that had their centroid in the Service Area. This method captured most of the urban area covered by the Service Area. See map below as an example. Blue areas are selected BGs. Red outline is the service area. Please note that the image below shows 1990 BGs. The boundaries for each BG may change for each Census year.



Planning Excellence



2. The BGs were manually selected for the area that was not covered by the selected BGs.



3. For the manually selected BGs, the ratio of parcels within the BG and within the service area to the total number of parcels in the BG was calculated. This ratio was then applied to the BG figures for population. For example one of the BGs shown above has a total of 860 parcels within the BG. However, only 749 of those parcels in the BG are also in the service area. The ratio of .87 was applied to the population within the BG.

4. These totals for population from the BGs that are partially in the service area were then added to the population figures obtained in Steps 1 to get total estimated population.

## Shelley Flock

---

**From:** Anais Schenk [aschenk@ambag.org]

**Sent:** Monday, March 28, 2011 2:57 PM

**To:** Shelley Flock

**Cc:** Ron Duncan

**Subject:** Population Figures

**Attachments:** Census Population Figures.xls

Good Afternoon,

I hope your agency weathered the stormy weather alright. Attached are the population figures from 1990, 2000 and 2010 Census data. I spoke to Shelley about this last week, but unfortunately the 1990 data was only available at the Block Group level. I have included totals for both Block Group and Block for the years 2000 and 2010.

There are a couple of questions you may have as you look at the data. First, you will notice in both versions of the estimates (block and block group) the population declines between 2000 and 2010. This is consistent with the trends in the unincorporated area of Santa Cruz County as a whole.

Second, the block numbers are lower than the block group numbers are. This is due to a the fact that the geographies are smaller and therefore the figures will likely be more accurate than estimates for a larger geography.

Lastly, there are several reasons why I believe why our forecast is different than the 2010 Census figures. Randy began to touch on some of these issues last week. However, first and foremost the Forecast did not predict a major economic downturn even though it did account for a minor recession with a weak economy. The AMBAG Forecast is more in line with the Department of Finance figures, but unfortunately both are off from the Census. Also, the geography used in the Forecast (Traffic Analysis Zone) is different than Census Blocks and therefore the estimate will vary as well.

Please feel free to call me if you have any questions or concerns.

Thank you,

Anais Schenk | Planner | AMBAG  
Direct 831.264.5088 | Fax 831.883.3755

Census Year	Soquel Creek Water District Service Area				Unincorporated Santa Cruz County		AMBAG Forecast		Difference Between Forecast & Census	Percent Change
	Population using BGs	Percent Change	Population using Blocks	Percent Change	Population	Percent Change				
1990	39,392				130,086		2005	40,741		
2000	40,227	2%	38,403		135,326	4.0%	2010	41,514	2,638	1.9%
2010	38,876	-3%	37,720	-2%	129,739	-4.1%	2015	41,602		0.2%
							2020	42,565		2.3%
							2025	42,962		0.9%
							2030	43,344		0.9%
							2035	43,831		1.1%

**Appendix J**  
**AMBAG Projected Population, Employment and Housing Estimates for**  
**2015-2035, and Associated Methodology**

## Shelley Flock

---

**From:** Anais Schenk [aschenk@ambag.org]  
**Sent:** Friday, February 18, 2011 1:51 PM  
**To:** Shelley Flock  
**Cc:** Ron Duncan; Randy Deshazo  
**Subject:** RE: AMBAG Population Forecast for Soquel Creek Water District  
**Attachments:** Soquel Creek Water District.pdf

Hi Shelley,

I pulled the TAZs from the northern portion of the map where service has yet to start. The result is shown below. I also modified the map for you to reflect this change. With regard to the previous figures given to you in 2005, it appears that a very different methodology was used. I have not been able to find any documentation of it. However, using Census tracts for your service area will result in less reliable figures as the Census tracts are very large in your service area. I would encourage you to use the figures we have given you from our 2008 Forecast. I would like to discuss this in greater detail with you whenever you have the chance. Our office will be closed on Monday for President's day. Have a good weekend.

### Modified Forecast based on Removal of Portion of Service Area

Population						
2005	2010	2015	2020	2025	2030	2035
40,741	41,514	41,602	42,565	42,962	43,344	43,831
Housing Units						
2005	2010	2015	2020	2025	2030	2035
20,465	20,924	21,192	21,702	21,940	22,178	22,427
Employment						
2005	2010	2015	2020	2025	2030	2035
17,014	17,305	18,850	20,385	22,001	23,682	25,467

Anais Schenk | Planner | AMBAG  
 Direct 831.264.5088 | Fax 831.883.3755

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**From:** Shelley Flock [mailto:shelleyf@soquelcreekwater.org]  
**Sent:** Thursday, February 17, 2011 4:15 PM  
**To:** Anais Schenk  
**Cc:** Ron Duncan; Randy Deshazo  
**Subject:** RE: AMBAG Population Forecast for Soquel Creek Water District

Hi Anais,

Thank you for the quick response to our questions. We took a look at the TAZ's and it looks like they match up fairly well with our service area with the exception of a couple of areas in which you had to make some adjustments. However, can you rerun the analysis after removing the small separate portion in the upper northeast section of the map? This area reflects property we own for future water supply development purposes, but we do not currently serve the population in this area. Sorry, but I forgot to take that out in the original map I sent Randy. (Note: If you need to charge us for this, please include it as a line item in the quote you provide for the analysis requested below).

Also, would you please review the attached methodology (Appendix A) from the Dept. of Water

4/14/2011

Resources that provides an alternative method for estimating service area population and provide us with a quote for running this analysis? You would only need to do Steps 1-3. We will do Steps 4 & 5 as they rely on our service connection data.

This alternative method uses year 2000 census estimates coupled with our year 2000 residential service connection data, and then applies a ratio to subsequent years based on the number of residential service connections for each year. In our phone conversation yesterday, you mentioned that 2010 census data may be available next month. If this is a sure thing, then it would be better for us to wait and use the 2010 data; however, if this schedule may slip, we should go ahead and use the 2000 data to run this analysis.

Lastly, the previous population estimates provided by AMBAG were compiled in 2005. I can't find any documentation from AMBAG, but the 2005 Urban Plan indicates that census tract information (available at the time the document was prepared) was used. Annual projected growth rates based on census tract projections (a low to high range) were then applied for years 2006-2010, and 2011-2015, to obtain population projections for 2010 ( 50,675 persons) and 2015 (52,075 persons). The following Santa Cruz County census tracts were used for the low range growth rate: 1216, 1217, 1219, 1221, and 1222. The high range growth rate used census tracts 1211, 1216, 1217, 1219, 1220, 1221 and 1222. AMBAG only had projected growth rates up to 2015, so growth rates between the years 2015 and 2030 were estimated using straight-line projections and at rates slightly less than previous years.

Please let me know if you have any questions or need additional information. Thanks for your help.

**Shelley Flock**

*Staff Analyst*

*Soquel Creek Water District*

5180 Soquel Creek Drive , Soquel , CA 95073

(831) 475-8501, x156

[shelleyf@soquelcreekwater.org](mailto:shelleyf@soquelcreekwater.org)

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**From:** Anais Schenk [mailto:aschenk@ambag.org]

**Sent:** Wednesday, February 16, 2011 5:25 PM

**To:** Shelley Flock; Ron Duncan

**Cc:** Randy Deshazo

**Subject:** AMBAG Population Forecast

Hi Shelley,

Attached you will find a map showing the traffic analysis zones (TAZs) that were entirely included as well as those that were partially included in the forecast using a proportional adjustment. (Please see methodology.)

With regard to searching for the methodology used in the previous figures given to you, it would be really helpful to know when those figures were given to you. Do you know the year that the previous AMBAG employee gave you the forecast?

Lastly, I promised to get you in touch with Randy Deshazo who worked on the forecast. You can email him at the email address included in the CC field or you can call him at (831) 264-5086. You can also download the forecast document which includes a detailed methodology description from AMBAG's homepage: <http://ambag.org/> Go to the Bulletin Board and scroll all the way down to the bottom. The document is called "2008 Regional Forecast Population, Housing Unit and Employment Projections."

Anais Schenk | Planner

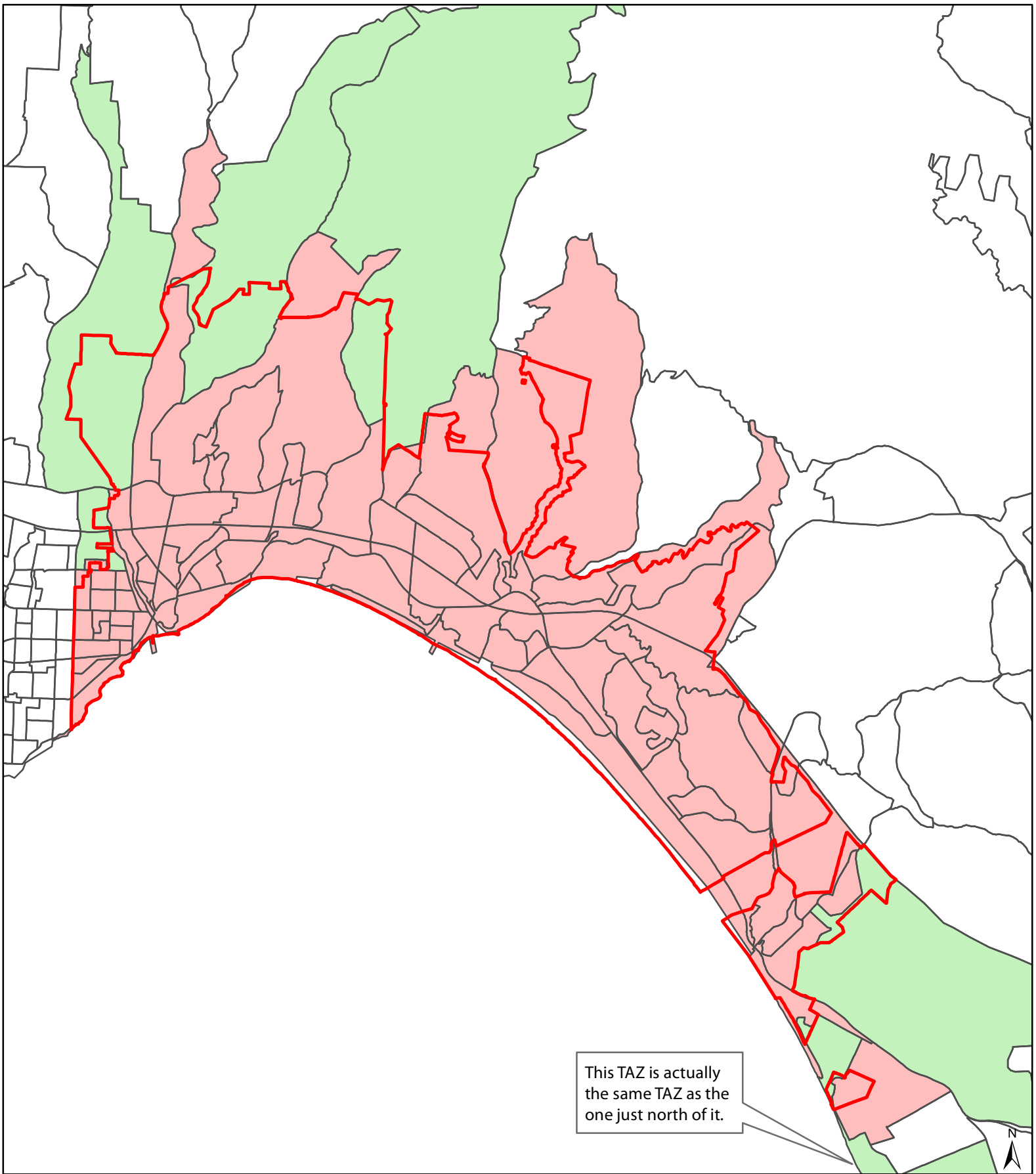
Direct 831.264.5088 | Fax 831.883.3755





4/14/2011

### **Methodology for Identifying Projected Population in Soquel Creek Water District Service Area**

1. Identified Traffic Analysis Zones (TAZs) that had their centroid in the service area.
2. Using an aerial, identified TAZs where most of the urban area was within the service area even though the centroid of the TAZ was not. These TAZs were added to list of those obtained in Step 1.
3. There were a few locations where the service area only partially overlapped with a TAZ and the majority of the TAZ was urbanized. These TAZs were not included in the first two steps.
  - a. For these TAZs, the ratio of parcels within the service area to the total number of parcels in the TAZ was calculated.
  - b. This ratio was then applied to the TAZ numbers for population, housing and employment.
  - c. The numbers for population, housing and employment for the TAZs isolated in step 3b were added to the numbers for population, housing and employment obtained in Steps 1 and 2.

# Traffic Analysis Zones Used for Soquel Creek Water District Population Forecast



-  Soquel Creek Water District Service Area
-  TAZs with Centroid or Most of Urban Area in SQWD Boundary
-  Traffic Analysis Zones (TAZs)
-  TAZs Adjusted Using Proportional Method

0 0.3 0.6 1.2 1.8 2.4 3 Miles

Data Source: AMBAG Date: February 16, 2011



**Appendix K**  
**Methodology for Developing Non-Census Year Population Estimates for**  
**2001-2009**

# Appendix K

## Methodology for Developing Non-Census Year Population Estimates for 2001-2009

### Weighted average of number of persons per residential unit for SqCWD service area

by Shelley Flock, April 11, 2011

\*Capitola = 2.0 persons/unit

\*Unincorporated Santa Cruz Co. = 2.61 persons/unit

\* These numbers were provided by AMBAG. They are based on Department of Finance data and represent an average of Single- and Multifamily units.

Total Population for SqCWD service area in 2010 (provided by AMBAG, based on 2010 Census data at Block level) = 37,720 persons

Total Population for Capitola in 2010 (from 2010 Census data) = 9,918 persons

2010 service area population - 2010 Capitola population = 2010 unincorporated service area population

$$37,720 \text{ persons} - 9,918 \text{ persons} = 27,802$$

$$\begin{aligned} \text{\% of service area within City of Capitola} &= 9,918 / 37,720 \\ &= 26\% \end{aligned}$$

$$\begin{aligned} \text{\% of service area within unincorporated Santa Cruz Co.} &= 27,802 / 37,720 \\ &= 74\% \end{aligned}$$

Average number of persons per unit in service area =  $(0.26 \times 2.0 \text{ persons/unit}) + (0.74 \times 2.61 \text{ persons/unit})$

**Average number of persons per unit in service area = 2.45**

1990 population estimates were not available at the Block level, however they were available at Block Group level

2005 and 2010 data were available at both Block and Block Group levels. Since the Block level is more precise, we used the percent difference (2%) between the 1990 and 2000 Block Group level data to extrapolate the 1990 Block level population.

1990 Block level population = 2000 population -  $(0.02 \times 2000 \text{ population}) = 38,403 - (0.02 \times 38,403)$

**1990 Block level population = 37,635 persons**

### **% of Total Population in Single-Family Versus Multifamily Units**

For 1990, 2000, & 2010 (years with known populations) we determined what % of the total population lived in single-family versus multifamily based on # of SF connections and an average persons per unit for service area of 2.45.

<b>Year</b>	<b>Population</b>	<b>SF Conn</b>	<b>Persons/Unit</b>	<b>SF Population</b>	<b>MF Population</b>	<b>SF % of Pop</b>	<b>MF % of Pop</b>
1990*	37,635	10,956	2.45	26,842	10,793	0.71	0.29
2000	38,403	12,167	2.45	29,809	8,594	0.78	0.22
2010	37,720	12,447	2.45	30,495	7,225	0.81	0.19
				<b>Average % for 2000/2010</b>		<b>0.79</b>	<b>0.21</b>

If you know the # of single-family connections for a year, can use the averages for %SF (0.79) and %MF (0.21) to solve for the total annual population.

\* For 1990, did not have the breakout for SF and MF. Assumed SF made up 96% of the total connections (based on 1995 breakdown).

Estimated Population for 1991-1999 and 2001-2009*							
Year	SF Conn	Persons/Unit	SF Population	SF% of Pop	MF% of Pop	MF Population	Total Population
<b>1990</b>	<b>U.S. Census Year</b>						<b>37,635</b>
1991	NA	2.45	NA	0.79	0.21	NA	NA
1992	NA	2.45	NA	0.79	0.21	NA	NA
1993	NA	2.45	NA	0.79	0.21	NA	NA
1994	NA	2.45	NA	0.79	0.21	NA	NA
1995	11,744	2.45	28,773	0.79	0.21	7,648	36,421
1996	11,822	2.45	28,964	0.79	0.21	7,699	36,663
1997	NA	2.45	NA	0.79	0.21	NA	NA
1998	NA	2.45	NA	0.79	0.21	NA	NA
1999	12,840	2.45	31,458	0.79	0.21	8,362	39,820
<b>2000</b>	<b>U.S. Census Year</b>						<b>38,403</b>
2001	12,118	2.45	29,689	0.79	0.21	7,892	37,581
2002	12,120	2.45	29,694	0.79	0.21	7,893	37,587
2003	12,190	2.45	29,866	0.79	0.21	7,939	37,804
2004	12,212	2.45	29,919	0.79	0.21	7,953	37,873
2005	12,267	2.45	30,054	0.79	0.21	7,989	38,043
2006	12,275	2.45	30,074	0.79	0.21	7,994	38,068
2007	12,293	2.45	30,118	0.79	0.21	8,006	38,124
2008	12,417	2.45	30,422	0.79	0.21	8,087	38,508
2009	12,408	2.45	30,400	0.79	0.21	8,081	38,481
<b>2010</b>	<b>U.S. Census Year</b>						<b>37,720</b>

\*Populations shown in bold for 1990, 2000 and 2010 are based on U.S. Census data at Block level (for 2000 and 2010).

The 1990 data was derived as shown above.

Estimated SF populations are based on the number of connections multiplied by persons per connection. Since numerous MF meters serve more than one unit, a percentage method was used to estimate MF population.

MF pop. = (SF pop. X MF%) / SF%

**Appendix L**  
**Background Information on “Social, Economical, Political, Technological”**  
**Evaluation or “SEPT” to Estimate Projected Water Savings**

*(Note: The SqCWD demand projections included in this Appendix were later revised to reflect the numbers reported in this 2010 UWMP; however, the SEPT methodology did not change).*

June 7, 2011

## MEMO TO THE BOARD OF DIRECTORS

Subject: Agenda Item No. 7.8

Water Demand Forecasting Methodology  
and Revised Estimates Proposed for 2010  
Urban Water Management Plan (UWMP)

- Attachments:
1. Table 1. Social, Economic, Political and Technological (SEPT) Forecasting Demand Evaluation
  2. Table 2. Comparison of Previous and Revised Demand Estimations
  3. Figure 1. Projected Demand Estimates

### Background

The 2010 Urban Water Management Plan (UWMP) requires agencies to predict water demand over a 20-year horizon from 2010 to 2030 at 5-year increments. Accurately predicting water demand is difficult because of the many variables. It is important not to under-estimate demand in that the District has a legal requirement to provide sufficient water for all current and future beneficial uses; however, in recent years, the District, like many other water purveyors, has consistently over-estimated water demand. The approach employed for the 1999 and 2006 Integrated Resources Plans and the 2005 UWMP used land use data, population growth rates and water use factors (Montgomery Watson, 1997 and ESA, 2006) to determine gross water demand and anticipated conservation savings from established best management practices. This methodology has consistently over-estimated actual demand, and staff believes that the social, economic, political and technological impacts on water use in present day California have an impact that is greater than the impact on water use from implementation of the District's conservation program alone

### SEPT Approach

Adopting the SEPT model may better accommodate the numerous factors that impact demand relative to the methods that the District has previously used and thus lead to more accurate demand estimates. The SEPT model is commonly used in the business world to perform demand forecasting. SEPT (sometimes referred to as PEST) is an acronym for "Social, Economic, Political, and Technological". Many businesses use the SEPT model in their strategic planning because it helps account for the macro-environment factors that may influence a forecast. Note that a SEPT analysis is not a prediction of what will happen, but more of a forecast of what is likely to occur. Accurately estimating future water use is difficult, but staff believes considering the SEPT factors will improve the results.

Although Environmental and Legal categories are sometimes added to the SEPT model, staff incorporated these categories under the traditional SEPT headings. For example, climate change was factored into the Social category based on the assumption that people might use a little more water outdoors due to the current studies of future regional weather patterns.

A SEPT analysis is usually performed in three steps. First, brainstorming is used to identify the relevant factors that may influence the forecast. Then the information and associated impacts relevant to these factors are identified. Finally, forecasts or conclusions are drawn.

### **District SEPT Analysis**

Staff performed a SEPT analysis as shown in **Table 1**, which displays the main factors considered. Although some factors are estimated to increase water use, staff estimated that overall consumption would decrease in each of the SEPT categories. Neither the 2006 Integrated Resources Plan nor the 2010 Well Master Plan demand projections shown in **Table 2** accounted for the full spectrum and girth of the SEPT factors.

The factors associated with the Social and Political categories are thought to cause overall water consumption to decrease slightly to moderately (i.e., a couple percent). For example, in the Social category, the “green” movement and educational efforts toward our youth are forecasted to decrease water use, while global warming may cause outdoor water use to increase. The Political pressures due to global, statewide and local water shortages are thought to lead to a decrease in future water consumption. The State mandate to reduce urban water consumption by 20% by 2020 is an example of a political influence.

The factors associated with the Economic and Technological categories are thought to have a moderate to significant impact on reducing water demand. The literature regarding the elasticity of consumption relative to rate increases suggests various values normally ranging from 0 to 0.3 (see **Table 1** for citations), with 0.2 being a typical value. A 0.2 elasticity value indicates that for every 10% increase in rates a 2% reduction in consumption can be anticipated. An elasticity range of 0.1 to 0.15 for the District appears in line with empirical evidence based on historical consumption decreases, rate increases from 2002 to 2010, community affluence, and the fact that customers have already implemented many water saving practices which results in demand “hardening” or the inability to reduce consumption by significant amounts. Staff recommends an elasticity estimate of 0.1 as an appropriate conservative value for District forecasting purposes. The demand declines associated with the current economy, weather and conservation were accounted for in the evaluation.

The *Financial Plan Update* by Bartle Wells, dated March 8, 2011, projected significant rate increases through 2017, and one can assume that there will be some modest additional rate increases from 2018 to 2030. Based on this information and an elasticity factor of 0.1, the reduction in demand associated with future rate increases is conservatively estimated to be 10% by year 2030.

Due to ubiquitous and severe world-wide water shortage issues, there are pressures and incentives to further increase water efficiency. Thus, it is reasonable to assume that there will be more technological developments that decrease water usage. As shown in **Table 1**, the proliferation of water saving technologies (e.g., ultra high-efficient toilets, 2.0 gallon per minute showerheads, etc.) are estimated to reduce future demand by several percent.

The challenge in applying the SEPT approach in forecasting demand for a vital resource like water is to be realistic but not to overstate the SEPT influence. There are limited examples in the water industry where this type of model has been applied. Determining the overall percentage change in demand using the SEPT approach requires qualitative and quantitative analyses. Some of the changes in the various SEPT categories are overlapping and thus a straight arithmetic approach is not appropriate. Based on professional experience and the analysis described in this memo and illustrated in Table 1, an overall 15% decline in per capita water demand is forecasted over the next 20 years (2011 – 2030).

### **Demand Projection Methodology**

The methodology for predicting future demand involved first estimating a gross per capita water usage value. Then, the gross per capita value was multiplied by the estimated future populations to determine a baseline consumption that does not account for SEPT factors. Finally, the predicted savings from the SEPT analysis were subtracted from the baseline projections to obtain the forecasted demand values. The following steps detail the process:

1. Estimated current and future population values. Obtained the population estimates from Association of Monterey Bay Area Governments (AMBAG) ranging from 2010 to 2030.
2. Calculated an average gross per capita demand value. This was done by dividing the average annual production for years 2006 – 2010 by the 2010 population. This results in a gross per capita demand value of 0.122 acre-feet/year (109 gallons per capita per day (gpcd)).
3. Estimated future baseline demand through 2030. This was done by multiplying the projected populations by the current (5-year average) gross per capita usage value of 0.122 acre-feet/yr. (Baseline is demand with no additional conservation or influence from SEPT factors.)

4. Performed the SEPT analysis indicating forecasted savings (15%) by 2030. Then applied this 15% savings in a linear fashion over time from 2010 to 2030 to the baseline projected demands.

### **Conclusions**

Overall, using the population estimates from AMBAG and using the SEPT evaluation prepared by staff, demand and forecasted decreases over a 20-year period (from 2010 to 2030) were derived. **Table 2** presents the SEPT-modeled forecasted demand values and the AMBAG population estimates. The forecasted 15% decrease is presented to occur in a linear fashion congruent with population growth, over the 20 years, equating to a 0.75% decrease per year or a 3.75% decrease every five years. This 15% reduction, in conjunction with the new population estimates, results in a new forecasted demand as shown in **Table 2**. **Figure 1** compares the SEPT-forecasted demand values with the 2006 and 2010 predicted demand values. In the SEPT forecast, demand rises initially due to a projected spike in population (per AMBAG), then the rate of population growth slows and the predicted rate of decreased demand starts to outpace growth.

Note that the short term (i.e. 2015) demand projections may be slightly exaggerated if the Water Demand Offset (WDO) program is in place. However, there are approximately 40 acre-feet of WDO credits for sale and some of the population increase over the next five years is partially believed to be repopulation of existing vacant units – these factors will lead to an increase in water consumption. The longer term (2015 – 2030) assumes the WDO program would be expired.

### **Discussion of Results**

Taking a broad view of the results, the SEPT analysis appears to produce reasonable demand values into the future. As shown on **Table 2**, the 5-year average (2006-2010) demand of 109 gpcd reduces to 93 gpcd in 2030, using the SEPT model. The District's 2010 per capita usage was 97 gpcd.

### **RECOMMENDED BOARD ACTION**

BY MOTION, approve the water demand forecasting methodology as presented to use in the 2010 UWMP.

By 

Ron C. Duncan

Conservation and Customer Service Manager

Table 1. SEPT Forecasting Demand Evaluation Exercise  
(Noted under the SEPT headings are examples of some of various factors to consider)

Social	Economic	Political	Technological
Will people go more "green" or get "burned" out?	Which way is the economy is headed long term?	State and Federal legislation driving water use. Example 20% by 2020.	System improvements (i.e., new pipes, leak detection, new meters, etc.).
Appears water conservation is gaining more ground. Educational programs, especially impact from younger generations over time	A 10% increase in the price of water is estimated to decrease water consumption by at least 1%. Assuming a 0.1 elasticity, significant projected rates increases through 2017 and anticipated additional rate increases from 2018 to 2030, consumption is forecasted to decrease by 10% by 2030. <sup>(1)</sup>	Will new regulations change the use of reclaim water? Will conservation/efficiency or restrictions become more prevalent in laws?	Toilet improvements (i.e., high-efficiency toilets (HETs) and now ultra high efficiency toilets (UHETs)).
Pressure due to energy concerns, eco groups	Water budgets could be instituted and impact consumption.	Possible emergency declarations and use curtailment.	Irrigation efficiencies (e.g., micro spray, drip, smart controllers, etc.).
Will customers apply more water to landscapes due to climate change or plant more water-wise landscapes?	Monthly billings?	New law requiring HETs and 2.0 gpm showerheads	Showerhead improvements (e.g., 1.5 gpm and 1.25 gpm showerheads now available).
<b>Consumption Trend Estimations Based on Above Considerations</b>			
Slightly down	Significantly down	Slightly to moderately down	Moderate to significantly down

SEPT = social, economic, political, technological

Notes:

<sup>(1)</sup> 2011 Update to 2010 Financial Plan (Bartle Wells) contains rate increases from 2010 to 2017.

Elasticity of price and water consumption was based on some of the following sources and empirical data from the District's rates and demands from 2002 to 2010.

Olmstead, S. 2008. Comparing price and non-price approaches to urban water conservation. PowerPoint presentation at the Water Resources Research Institute.

Espey, M., Espey, J., Shaw, W. 1997. Price elasticity of residential demand for water: a meta-analysis. Retrieved from <http://academic.research.microsoft.com/Paper/3602565>

Handbook for the Economic Projects. n.d. Chapter 4 Demand analysis and forecasting in Analysis of Water Supply Projects. Retrieved from [http://www.adb.org/Documents/Handbooks/Water\\_Supply\\_Projects/Chap3-r6.PDF](http://www.adb.org/Documents/Handbooks/Water_Supply_Projects/Chap3-r6.PDF)

Olmstead, S. And Stavins. 2008. Comparing price and non-price approaches to urban water water conservation. Harvard Business School Regulatory Policy Program. Retrieved from [http://www.hks.harvard.edu/m-rcbg/rpp/Working%20papers/RPP\\_2008\\_05\\_Olmstead.pdf](http://www.hks.harvard.edu/m-rcbg/rpp/Working%20papers/RPP_2008_05_Olmstead.pdf)

Thomas, F & Syme, G. 1988. Estimating Residential Price Elasticity of Demand for Water; A Contingent Valuation Approach. Water Resource Research, vol. 24, No II, , pp 1847-1857. Retrieved from <http://www.fwr.org/wrcsa/790100.htm>

Table 2. Comparison of Previous and Revised Demand Estimations

Year	2010	2015	2020	2025	2030
<b>Previous Demand Estimations</b>					
2006: Average demand with conservation from Integrated Resources Plan (IRP) (ESA, 2006) (note yrs. 2015 & 2025 extrapolated)	5210	5320	5430	5535	5640
2010: Average demand with conservation from Well Master Plan (WMP) (ESA, 2010) (note yr. 2025 extrapolated)	4800	4911	5016	5126	5235
<b>Demand estimations based on SEPT evaluation</b>					
2011 Revised projected baseline demand <b>without</b> additional conservation (AF) <sup>(a)</sup>	4615	5075	5193	5241	5288
Revised total projected cumulative savings based on SEPT analysis (AF) <sup>(b)</sup>	na	190	381	584	786
Projected demand estimated w/ SEPT approach (AF)	na	<b>4885</b>	<b>4812</b>	<b>4657</b>	<b>4502</b>
Per capita demand w/ conservation value (total pumping / population) (gpcd) (Note: actual 2010 production was 4084 AF and per capita was 97 gpcd)	109	105	101	97	93
Projected Population <sup>(c)</sup>	37,720	41,602	42,565	42,962	43,344
Change in population over preceding 5-year interval	na	3882	963	397	382

AF = acre-feet

SEPT = social, economic, political, technological

gpcd = gallons per capita per day

<sup>(a)</sup> For 2010, production was based on an average of actual for five-years from 2006 - 2010. For other time periods production was estimated based on population x a gross usage per capita. The gross usage per capita was set at 0.122 acre-feet/yr, calculated from the production value used for 2010 divided by the population (4615 af/yr / 37,720 people = 0.122 af/yr/person).

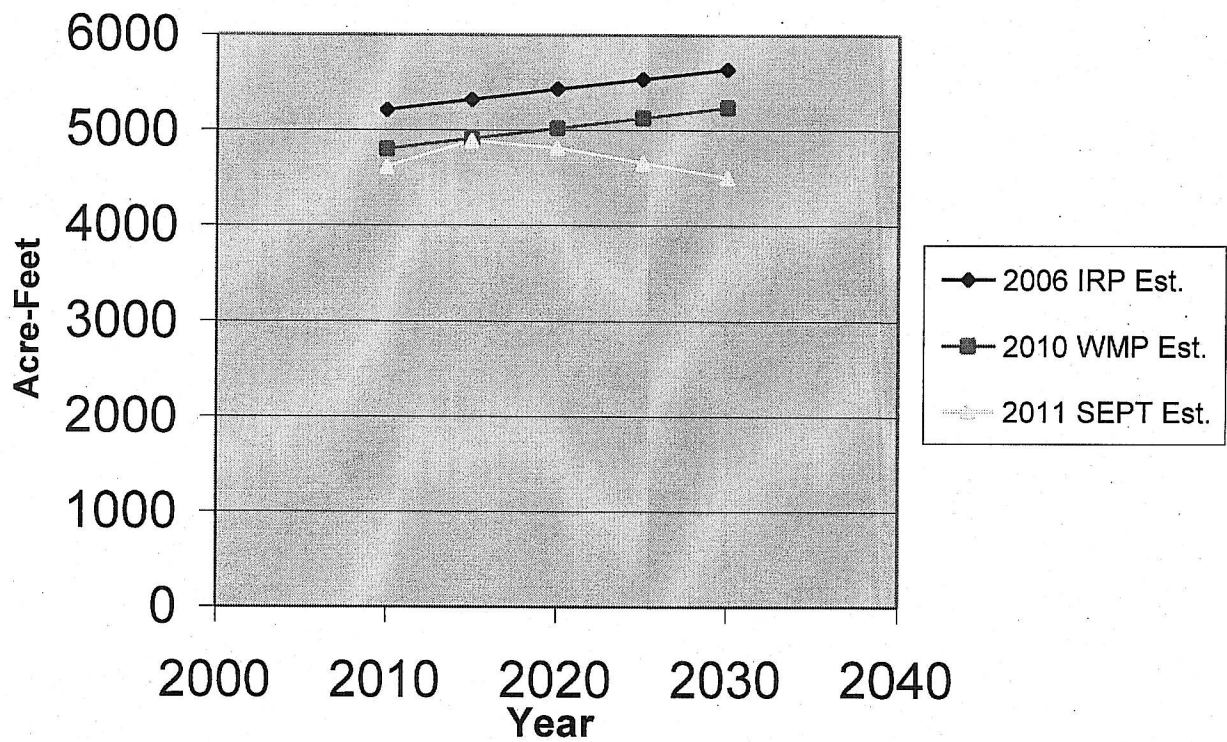
<sup>(b)</sup> Staff performed a qualitative forecasting evaluation to estimate future savings to be achieved. This evaluation accounted for future social, economic, political, and technological factors. The estimated result is that in 2030 about 15% more savings will be achieved than occurs in 2010. For planning purposes, the savings are estimated to occur in a linear fashion over the 20 years at 3.75% every 5 years, or 0.75% per year. Note that this evaluation is a forecast and should be updated and refined on a periodic basis or if significant demand alternating events occur.

<sup>(c)</sup> Population data based on AMBAG analysis. They used Census data for 2010. Projections for 2015, 2020, 2025, and 2030 are based on 2008 Regional Forecast. The 2008 and 2010 data provided relatively similar numbers.

#### References

ESA. 2006, March 1. 2006 Integrated Resources Plan. Final, p. 4-12.  
 ESA. 2010, Sept. 1. Soquel Creek Water District Well Master Plan. Draft EIR Report, p. 2-11.  
 Millet, J. 2004, March 2. Conservation Part 2. Provided as a PowerPoint in Presentation, presented at at a SqCWD Board meeting on March 2, 2004.

**Figure 1. Projected Demand Estimates**



**Appendix M**  
**Electronic Copies of the 2007 Groundwater Management Plan**  
**and the 2011 Well Master Plan**

*(Note: Copies are only included in the final 2010 UWMP sent to DWR. Both reports may be viewed online at [www.soquelcreekwater.org](http://www.soquelcreekwater.org)).*

**Appendix N**

**Memo from John Ricker, Santa Cruz County Environmental Health  
Services Agency, Water Resources Division Director, May 11, 2011**



# County of Santa Cruz

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## HEALTH SERVICES AGENCY

701 OCEAN STREET, ROOM 312, SANTA CRUZ, CA 95060-4073  
(831) 454-2022 FAX: (831) 454-3128 TDD: (831) 454-4123

[www.co.santa-cruz.ca.us/eh/ehhome.htm](http://www.co.santa-cruz.ca.us/eh/ehhome.htm)

### ENVIRONMENTAL HEALTH

May 11, 2011

Ms. Laura Brown, General Manager  
Soquel Creek Water District

### **Subject: Status Report on the Potential for Surface Water Transfers in Northern Santa Cruz County**

Dear Laura:

Your Board has requested a status report on the County's efforts to explore the feasibility of conjunctive use and water transfers in the northern Santa Cruz County area. The following report summarizes the potential benefits, identifies potential limitations/challenges, and next steps for further evaluating the potential to transfer excess winter streamflow from the City of Santa Cruz intake on the San Lorenzo River to reduce overdraft in both the Scotts Valley and Soquel areas. This information will also be shared with the Board of Supervisors and the Santa Margarita Groundwater Committee.

It is important to note that discussions about this potential water transfer have so far been restricted to staff of the affected water agencies. There have been no formal discussions with the governing boards so there has been no vetting of political or jurisdictional issues. Moreover the work to date must be considered preliminary in nature much as one would consider an engineering feasibility report. More modeling and engineering analysis is required as described in this report.

### **Background**

Conjunctive water use involves utilization of multiple water sources, usually both surface and groundwater sources, in a way that maximizes water storage and availability under different climatic conditions. This can involve transfers among water agencies of winter streamflow, summer groundwater, recycled water, and water from desalination. Conjunctive use can both provide for increased water supply reliability and increased summer stream flows for fish habitat as a result of increasing groundwater storage and reducing summer stream diversions.

Under the Santa Cruz Integrated Regional Water Management Program, County staff have worked with other agency partners on a Proposition 50 funded effort to identify the best approaches for conjunctive use and increased groundwater storage in the Lower San Lorenzo Watershed. The first phase of this work is currently being completed by Kennedy/Jenks Consultants. The consultant evaluated a variety of water sources and methods for increasing groundwater storage, including: restoration of stormwater infiltration in urbanized areas of Scotts Valley, water transfers of surplus winter streamflow from Santa Cruz to reduce Scotts Valley area groundwater pumping, and use of winter streamflow for direct groundwater recharge.

County staff have expanded on the consultant's work to further evaluate the availability of surplus winter water from the San Lorenzo River to reduce groundwater pumping and increase groundwater

storage in both the Scotts Valley and Soquel areas. Both of these areas are experiencing overdraft and could benefit from this conjunctive use effort as an augmentation to their water supply portfolios, although the initial yield and reliability for the Soquel area appears to be significantly less than the present supplemental supply need. The results of this preliminary analysis look very promising and Proposition 84 grant funds will be used to further develop operational details, address legal and regulatory requirements, and complete engineering designs and cost estimates. Pending that more in depth analysis, we can present a generalized description of the potential system operation and possible benefits.

### **Operational Approach**

The source of additional water would be the San Lorenzo River where it enters the Santa Cruz City Limits at Tait Street. This is the City of Santa Cruz's primary source of water where they have a water right to take up to 12.2 cubic feet per second (cfs) throughout the year. However, during most winters when demand is low and the City's north coast stream sources have more available flow, the City only uses about 5.4 cfs from the River, which would leave 6.7 cfs that could potentially be available for transfer to Scotts Valley and Soquel. The additional flow would be treated at the City's Graham Hill treatment plant and delivered as potable water to the other areas for direct use instead of pumped groundwater (in-lieu recharge) or for infiltration to the basin (managed recharge).

It was assumed that additional diversions from the River would only take place during the period of December through March and only at times when a downstream bypass flow of at least 25 cfs could be maintained for protection of fish migration and habitat. Diversions would not take place during very high flows (greater than 300 cfs) due to the high likelihood of excessive, untreatable turbidity. Staff analyzed average daily flow records for the past 35 years to identify which days had flow conditions that would have allowed a diversion of additional water for transfer to the other agencies. The amounts that could be diverted each day were added up to calculate how much total flow could be diverted each year. This amount was then compared to the 2008 winter demand for the Scotts Valley and Soquel service areas. It was assumed that Scotts Valley would have the higher priority for receiving water because the underlying Santa Margarita groundwater basin is in the San Lorenzo Watershed, it is a smaller basin that would recover more quickly with reductions in pumping, and a recovery of groundwater levels would provide more immediate fish benefits in terms of increased summer baseflow in Bean Creek.

Two other scenarios were also run: one assuming that the City would reduce pumping from the north coast and that less San Lorenzo River water would be available for transfer (only 5.8 cfs), and another assuming that there would be more available for transfer (13.5 cfs) as a result of infrastructure upgrade and increased water rights. The annual amounts that could be available for transfer are shown on the attached chart.

### **Potential Benefits**

Based on this preliminary analysis, and subject to potential limitations as described in the next section, the following benefits might result if this scheme were pursued:

- Under the flow regime of the past 35 years, using current infrastructure and excess water available under current water rights, diversion of excess winter (Dec.-March) flows could produce an average of 800 acre-feet per year (af/yr). Scotts Valley's winter demand of 480 af, could be fully satisfied 31 out of 35 years. This includes both the Scotts Valley Water District and the southern portion of the San Lorenzo Valley Water District. After Scotts Valley winter demand was met, an average of 340 af/yr could be delivered to the Soquel Creek Water District, which amounts to about one third of Soquel's winter demand. Soquel could receive at least 200 af. 22 out of 35 years.

- In the longer term, if water rights were increased and pumping capacity was upgraded, additional Soquel demand could be met and/or water could be made available for direct recharge into the Scotts Valley groundwater basin.. Under this scenario, with up to 13.5 cfs total available for transfer the average total annual yield would be 1415 af/yr, with Soquel receiving an average of 810 af/yr, and an additional average of 140 af/yr available for direct recharge in Scotts Valley. Increased yields might be able to be obtained through upgrade of the treatment plant capacity and further increasing the water right. In the long term, this could potentially supply blend water to also allow direct recharge of Scotts Valley recycled water during the winter.
- Computer modeling of the Santa Margarita Groundwater Basin suggests that winter in-lieu recharge for Scotts Valley (approx. 500af/yr) would result in a 0.25 cfs increase in summer baseflow of Bean Creek. Additional direct recharge of an additional 500 af/yr could increase Bean Creek summer baseflow by another 0.25 cfs, for a total increase of 0.5 cfs after 10-20 years of recharge, providing a significant increase in salmonid rearing habitat in Bean Creek and an increase in flow in the lower San Lorenzo River.
- The potential for increasing summer flow in Soquel Creek by reducing deep aquifer pumping (i.e., District wells) has not been modeled. In theory, a significant reduction of groundwater pumping in the Soquel basin could eventually allow groundwater levels to come up with some increase in summer flow of Soquel Creek. These benefits would most likely take more than 20 years to occur and the direct benefit to baseflow from the proposed transfer scheme would depend on how this added resource would be used, e.g. how much would be stored in the Purisima A/AA units that underlie Soquel Creek as opposed to other aquifers within the Soquel/Aptos groundwater area and any exchange agreements that would bank this water for drought use by the City of Santa Cruz. Any water that comes to Soquel would most likely be utilized first to recover coastal groundwater levels, which would have with less benefit for the inland areas and stream baseflows.
- Other conjunctive use projects are also being evaluated to address the overall water supply shortage issue in Northern Santa Cruz County. These include: 1) a project being considered by Scotts Valley Water District and the City of Santa Cruz that would result in the delivery of recycled water from Scotts Valley to the Pasatiempo Golf Course for summer irrigation, with the savings in potable water being delivered from Santa Cruz to Scotts Valley; and 2) the regional seawater desalination project being evaluated by the City of Santa Cruz and Soquel Creek Water District. The proposed surface water transfer would work well within the context of the other conjunctive use projects and further enhance and diversify water supply portfolios for the region.

### **Additional Considerations and Possible Challenges**

There are a number of factors which could result in an increase or decrease in the possible yield of this proposed project. These issues will be subject to further consideration and definition:

- The City is currently negotiating with the National Marine Fisheries Service and California Department of Fish and Game regarding the terms of a habitat conservation plan (HCP) which would allow them to continue taking water from streams while minimizing the adverse impacts on threatened and endangered fish species. It is likely the final HCP may require the City to take less water from the north coast streams, which would require them to take more from the San Lorenzo River, reducing the amount of surplus available for transfer to other agencies until such time as the water rights could be expanded. A 20% reduction in water diverted from north coast streams, would reduce the amount that could be transferred to other agencies by an average of 110 af/yr.
- The allowed diversion season was assumed to be December 1 to March 31, pursuant to broad northern California guidelines promulgated by the resource agencies. However, there are frequently large volumes of flow in the San Lorenzo River later in the spring, and the diversion season could potentially be extended, provided adequate downstream releases were provided.
- The proposed downstream release of 25 cfs. at Tait Street needs to be further evaluated. A more detailed review of the City's data on habitat conditions and discussion with the resource agencies

might indicate that the minimum winter release could be reduced without any adverse impact on habitat. On the other hand, a greater release might be required. The total diversion proposed under current water rights would only amount to 6-10% of the total River flow during that four-month period, based on records from 2009 (a dry year) and 2010 (a normal year).

- The analysis calculates available surplus on a daily basis, but accumulates and applies that surplus over the whole winter period. The analysis should be further refined by accounting for Scotts Valley and Soquel demand on a monthly or daily basis and doing a more detailed daily modeling of the City's operations and infrastructure.
- Although the initial transfers proposed would be within the allowed diversion amount of current City water right, the water right will require amendment by the state to expand the allowed place of use. A new water right or amendment typically takes at least 20 years for approval, although there may be some mechanisms to more rapidly allow conjunctive use water transfers on an interim basis. It has been suggested that north coast pre-1914 water rights could be transferred without state approval. However, such a transfer would still require approval of the resource agencies and the City does not want to give up its north coast water rights as that is their best quality water.
- Upgrades of City infrastructure and an increase in the water rights could increase the amount of water available for transfer by 75%. This might be further increased with an upgrade of the treatment plant capacity, if that were feasible. This could provide water for direct recharge, primarily in Scotts Valley, and could promote more rapid recovery of the groundwater basins. Any consideration of direct as opposed to in-lieu recharge would include an analysis of the feasibility, limitations and cost of developing recharge facilities.
- Under any agreement for water transfer, it is expected that the City will want to maintain its priority for full use of its existing water rights and would only approve transfer of unneeded surplus as long as that is available. For this reason, and the uncertainty of climate change impacts on precipitation, recharge, and runoff, the reliability of conjunctive use as a supply source is a concern for Soquel Creek Water District. Excess surface water through a water transfer scheme does not provide a guaranteed volume year-in and year-out.
- The proposed water transfer schemes for Scotts Valley and Soquel do not provide any immediate water to the City of Santa Cruz, which needs a source of 1600 af/yr in the event of a multiple year drought and likely an additional amount due to restrictions based on the Habitat Conservation Plan. Although some water could possibly come back to Santa Cruz from Soquel or Scotts Valley in the future, once the groundwater basins recover, it cannot be predicted when this would be available and how much would be available.

This water transfer scheme would not eliminate the need for the proposed desalination plant or some other significant source of supplemental water in combination with continued conservation efforts. Assuming Scotts Valley exercises its priority to receive water and the City of Santa Cruz's water rights for the San Lorenzo River are not increased, the average yield for Soquel Creek Water District from the transfer project would be 340 af/yr. This is substantially less than the minimum 1,200 af/yr guaranteed from the proposed desalination project and the forecasted needs of approximately 1,880 af/yr that Soquel may need to initially restore the basin.

### **Next Steps**

Staff has shared this analysis and engaged in preliminary consultations with staff from the City of Santa Cruz, Soquel Creek Water District, Scotts Valley Water District, San Lorenzo Valley Water District and National Marine Fisheries Service. All the agencies believe the scheme for intraregional transfer of water should be further explored to maximize use of available water resources. The Santa Cruz Region was recently awarded a Proposition 84 Integrated Regional Water Management planning grant, which will provide \$210,015 to help fund many of next steps, with an expected completion in 2012:

- Present this conceptual plan to the governing bodies of all of the affected agencies to gauge interest in pursuing the scheme and seek commitments from each of the agencies to cooperate in the work required to bring the evaluation to successful completion.
- Work with the City of Santa Cruz and other agencies to review and fine-tune the potential operation of this project. The City has an operations model that could be modified to incorporate this and test various assumptions to determine the potential outcomes and volumes of water that can be delivered. Scotts Valley and Soquel would need to evaluate how their systems would operate with this additional source of supply and the cost, benefits and operational considerations regarding in-lieu vs. managed recharge.
- Consult further with resource agencies regarding assumptions used regarding habitat protection and any additional concerns they might have. Review current fishery and habitat data and develop additional data if needed to establish the required downstream release.
- Consult with the State Water Resources Control Board and water rights experts regarding the potential for options to seek expedited approval for water transfers within existing water rights or emergency or interim changes of use. Seek long term modification and expansion of water rights.
- Develop preliminary designs and cost estimates of needed infrastructure improvements and operational cost estimates.
- If the project is determine to be viable, develop cooperative agreements among the involved agencies, prepare necessary environmental documents, obtain approval for water transfers or water rights modifications.
- Construct the necessary system interties to Scotts Valley Water District (including the southern portion of San Lorenzo Valley Water District) and Soquel Creek Water District.
- Complete designs and construction of facilities for direct recharge of groundwater in the Scotts Valley area.
- Evaluate the possible use of groundwater injection wells or aquifer storage and recovery wells for managed recharge in the Soquel-Aptos area.

### **Conclusion**

County Environmental Health staff will be coordinating the further development of this scheme for the sharing and effective use of available surface water resources. This work will be pursued with the assistance of grant-funded consultants and participation of the affected water agencies and resource agencies. We look forward to working with your District to further pursue this project. We will attend the May 17 meeting of your Board to make a brief presentation and answer any questions they might have.

Sincerely,

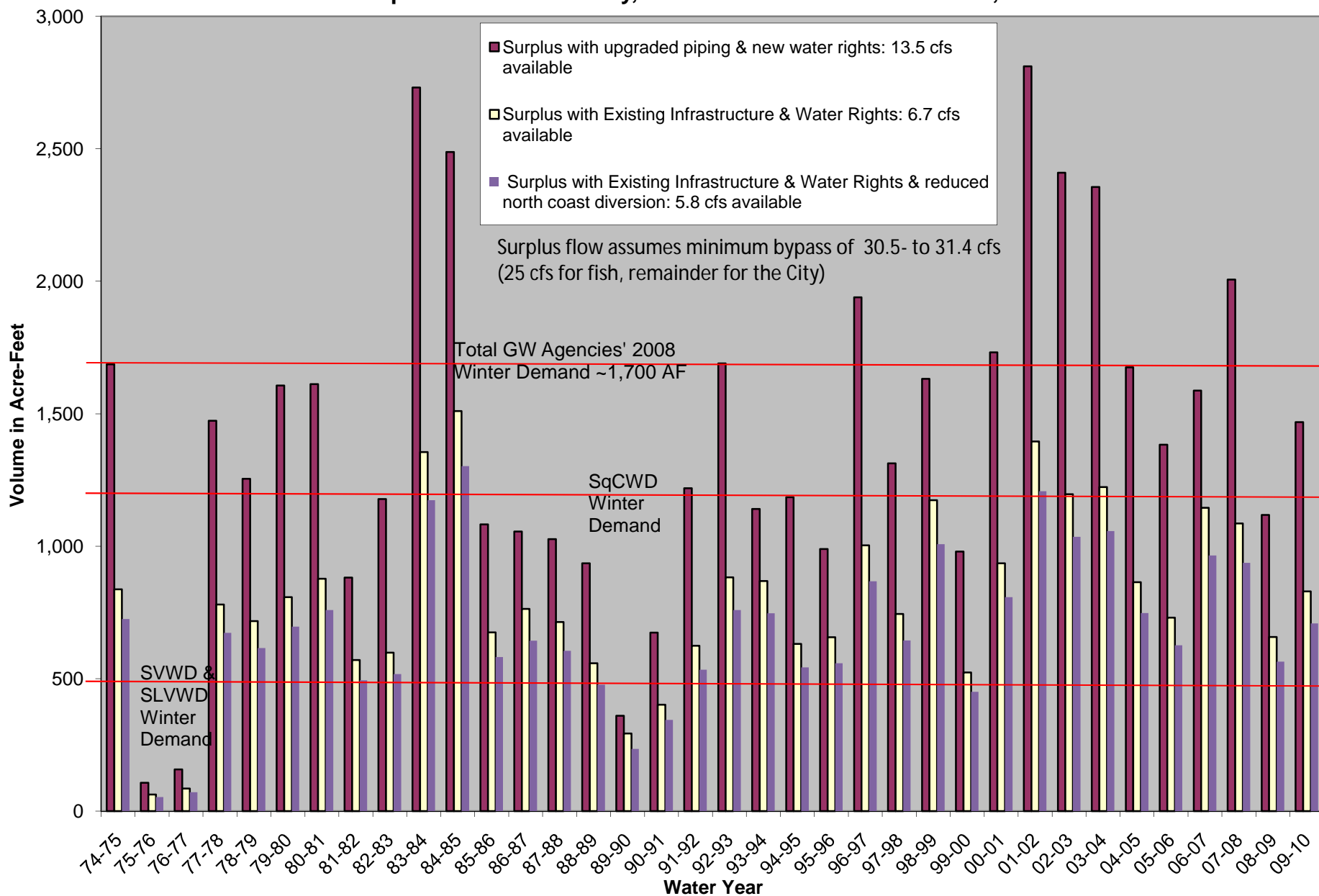


John A. Ricker

Water Resources Division Director

cc: Santa Cruz City Water Director  
General Manager Scotts Valley Water District  
General Manager, San Lorenzo Valley Water District

## Annual Winter Surplus Water Availability, San Lorenzo River at Tait Street, Various Scenarios



**Appendix O**  
**Copy of Model Resolution**  
**Establishing the Criteria to Declare a Water Shortage Emergency**

**RESOLUTION NO. {insert no.}**

**A MODEL RESOLUTION ESTABLISHING  
THE CRITERIA TO DECLARE A  
WATER SHORTAGE EMERGENCY**

WHEREAS, pursuant to California Water Code Section 350 et seq., the Soquel Creek Water District Board of Directors has conducted duly noticed public hearings to establish the criteria under which a water shortage emergency may be declared; and

WHEREAS, the Board of Directors of said District hereby finds, determines and declares as follows:

1. During {insert year}, the District served approximately {insert quantity} acre-feet per year (AFY) of water to District property owners and inhabitants; and
2. The demand for water service by District inhabitants and property owners is {insert expected status of future demand, i.e., expected to lessen, not expected to lessen}; and
3. For the foregoing reasons, customers shall be required to comply with the requirements and restrictions on certain non-essential water uses provided in the 2010 Urban Water Management Plan, *Section 5 - Water Supply Reliability and Water Shortage Contingency Planning*, when the General Manager or his/her designee determines that production capacity has been significantly reduced (e.g., by 20 percent or more) due to prolonged drought, contamination, natural disaster, loss of production well(s), major main break, prolonged power outage, or any other water supply emergency that limits the District's ability to provide adequate water service.

NOW, THEREFORE, BE IT RESOLVED, that the Board of Directors of the Soquel Creek Water District hereby concludes that a water shortage emergency condition exists that threatens the adequacy of water supply for human consumption, sanitation, and fire protection requirements, until the District's water supply is deemed adequate. After the declaration of a water shortage emergency, the General Manager or his/her designee of the Soquel Creek Water District is directed to determine the appropriate Rationing Stage and implement the District's Water Shortage Emergency Response.

BE IT FURTHER RESOLVED, that the District shall periodically conduct proceedings to determine additional restrictions and regulations which may be necessary to safeguard the adequacy of the water supply for domestic, sanitation, fire protection, and environmental requirements.

PASSED AND ADOPTED by the Board of Directors of the Soquel Creek Water District this *{insert day}* day of *{insert month}*, 2011 by the following vote:

AYES:

NOES:

ABSENT:

APPROVED:

\_\_\_\_\_  
*{insert name of Board President}*,  
President

ATTEST:

\_\_\_\_\_  
*{insert name of Board Clerk}*, Board Clerk